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THE CANADIAN ENTOMOLOGIST.

VOLUME VII.

Edited by W. Saunders,
LONDON, ONT.

ASSISTED BY

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OUR SEVENTH VOLUME.

With the present issue we enter upon the seventh year of our existence. On looking back over our past career, we see abundant reason for thankfulness and encouragement; from small beginnings we have grown to a respectable sized periodical, while in mechanical execution, typography, paper, &c., we give precedence to none. The completion of our past volume and the advent of the present number have been delayed by untoward circumstances beyond the time intended, but we are making a fresh start now, and hope by persevering effort to catch up lost time and issue regularly hereafter. To meet the wishes of several of our friends who desired to have certain material printed before the close of the sixth volume, we published last month a double number, consisting of forty pages with index added, so that our readers have been dealt with more liberally than we had promised, having received a volume of 260 instead of 240 pages. Many kind friends have helped us in the past with their contributions, and we gratefully observe that the number of helpers is increasing, as is shown by the recently issued list of contributors to the sixth volume; we trust that none of these will weary in well-doing, but continue their needed assistance and enlist their friends as far as possible in the same service. Original observations on the habits and life history of insects are especially desired, to make our journal still more useful and interesting. With the kind aid of our coadjutors, we shall endeavor to continue the papers on our common insects, which will, as heretofore, be accompanied by suitable illustrations, and shall, as far as possible, provide in each issue other material which will interest the general reader.

We would also take this opportunity of reminding our subscribers that subscriptions for the new volume are now due, and will be thankfully received by the Secretary, Mr. J. H. McMechan, London, Ont. It is with pleasure, also, that we inform our many correspondents that by the recent postal arrangements entered into by the United States and Canadian authorities, all letters mailed after the first of February will require a three cent stamp only to carry them from any part of the States to any part of Canada and *vice versa*, instead of six cents, as heretofore; post cards also will pass from one country to the other without the additional stamp.

CATOCALA NEBRASKÆ, Dodge.

BY G. M. DODGE, GLENCOE, DODGE CO., NEBRASKA.

Expanse, 2.70 inches. Primaries scalloped, apparently brown, being densely sprinkled with black scales on a reddish gray ground. Reniform tinged with red, clouded anteriorly with black, and having a black central spot. Sub-reniform indistinct. Terminal line nearly obsolete, the grayish band which precedes it showing plainest on the costa. All the transverse lines are black, and a curved row of seven black dots appears on the interspaces along the outer margin. Fringe dark, tipped with white.

Secondaries red, of about the same shade as appears in *C. parta*. Median band not much curved, and of nearly the same width as appears in *C. unijuga*, excavated anteriorly at the extremity of the discal cell, slightly constricted just after crossing the first median venule, and ends abruptly at the submedian vein; a few scattered scales appear beyond. Marginal band of medium width; even on inner edge, excavated opposite the termination of the median band, and ends about half way between the submedian and internal veins. Apex white, tinged with red.

Fringe white, spotted with black, which color predominates at the anal angle. Thorax same color as primaries. Abdomen clear brown, three of the segments tipped with white. Beneath, the general appearance much as in allied species. Median band of secondaries ends at submedian vein.

Taken at Glencoe, Dodge County, Nebraska, in August, 1874. Mr. Grote informs me that this species seems to be related to *Catocala Californica*.

NOTE ON CATOCALA NEBRASKÆ, BY A. R. GROTE, BUFFALO, N. Y.

Mr. Dodge has sent me a specimen of this species, recently discovered by himself. It is closely allied to the European *C. nupta*. It differs by the greater obliquity of the t. p. line and the shallower submedian sinus. The fore wings are otherwise quite similar in color and design, while the lines are more deeply black marked in *Nebraskæ*. The hind wings differ by the greater narrowness of the terminal band, and notably by the narrower, more rounded and non-angulated median fascia. The species seem to be related somewhat as *C. elocata* of Europe and *C. Walshii* of

North America. Perhaps it is this species *(C. Nebraskæ)* that has led Mr. Strecker (who has shown himself on other occasions to be inexact) to record "*C. nupta*" as being found in North America. I will remark here that Mr. Strecker's statement that the Californian species of *Nemophila* are identical with the European *Russula*, is contradicted by their description as distinct by Dr. Boisduval, who should be well acquainted with the variations of the European form. The statement that *Eupsychoma geometrica* is the exact equivalent of Mr. Walker's *N. petrosa*, made by Mr. Strecker, is erroneous, and is probably a careless rendering of Dr. Packard's previous statement that the two were probably forms of the same species. In *geometrica* the hind wings are entirely *black;* in *petrosa* (the type of which I saw in the British Museum) the hind wings are *white* or *yellowish*, with black markings. In my opinion it will eventuate that we have several species of *Nemophila* in our Western regions, none of them identical with *plantaginis*, and probably some of them (i. e. *Eupsychoma geometrica*) to be distinguished structurally, and therefore generically from *cæspitis* and *cichorii* and *plantaginis*.

CAPTURES OF NOCTUIDÆ AT ST. CATHARINES, ONT.

BY GEO. NORMAN, ST. CATHARINES, ONT.

In the spring of this year I commenced collecting the *Noctuæ* of this part of Canada, and in the hope that a list of my captures, with the dates of appearance, may be of interest, I venture to send the same for publication.

Being a stranger to the insect fauna of N. America, and in the absence of anything like a manual of the Heterocera, I should, even with the assistance of the Brit. Mus. Catalogues and Guenée's work, have had great difficulty in identifying my specimens. Fortunately this difficulty was removed by Mr. Grote, of Buffalo, who, in the kindest manner, has from time to time named my material. For this courteous assistance I am under lasting obligations. I have thought it advisable not in all cases to adopt the genera of Mr. Grote's "List of N. American Noctuidæ," for in the unsettled state of nomenclature at present existing, I prefer the arrangement of M. Guenée. This I, moreover do, for reasons not neces-

sary here to mention. It will be observed there are in my list several species, and even some genera, hitherto new to science; these have in nearly all cases been published by Mr. Grote in various journals. Many of the Homopteridæ I have omitted altogether, as it seems hopeless to identify them by the meagre descriptions existing. Finally, Mr. Grote has several specimens yet undetermined, which will have to be added to the list.

Thyatira cymatophoroides—14th July; at sugar; not common.
————*expultrix*—23rd June to July; not common.
Raphia frater—25th June; rare; at sugar.
Acronycta occidentalis—2nd June to August; common; at sugar and at rest.
———— *morula*—10th July; rare; at rest.
———— *connecta*—12th August; rare; at sugar.
———— *hastulifera*—26th June; not common; at rest.
———— *dactylina*—24th July; rare; at sugar.
———— *brumosa*—17th May to August; at rest and at sugar; not uncommon.
———— *Verrilli*—20th July; rare; at sugar.
———— *noctivaga*—6th June to August; rare; at light and at sugar.
———— *superans*—25th June and July; not unfrequent; at sugar.
———— *ovata*—18th June; bred; rare; at sugar.
———— *subochrea. N. sp.*—2nd July; rare; at sugar.
———— *dissecta*—17th June; two specimens at rest.
———— *oblinita*—26th May; rest; very frequent; a second brood in August; cocoons frequent on palings.
Bryophila lepidula—19th July; rare at sugar.
————*palliatricula*—29th June; frequent; at rest and at sugar.
Noctua sigmoides—29th June to August; not unfrequent; at sugar.
————*augur*—3rd July; eommon; at sugar.
————*baja*—3rd August to September; very common; at sugar.
————*C. nigrum*—11th June to September; very common; at sugar and light; specimens larger than in Europe.
————*bicarnea*—31st July to September; very frequent; at sugar and at lime blooms.
————*Normaniana. N. sp.*—21st July to September; frequent; at sugar. This has hitherto been, I believe, considered the same as *N. triangulum.* I am reminded much more of *N depuncta*, which seems its nearest ally.

Noctua clandestina—19th June to July; common; at sugar and lime blooms.
———*brunneicollis*—2nd July to September; rare; at sugar.
———*alternata*—1st July to September; very common; at sugar.
———*cupida*—17th July to August; frequent; at sugar.
———*rubi?*—4th August; rare; at sugar.
Agrotis herilis—31st July to September; very common; at rest, sugar and light.
——— *tricosa*—3rd August to September; very common; at rest, sugar and light.
——— *subgothica*—9th August to September; not so frequent as the above two species; at rest, sugar and light. All three species in abundance on flowers of Thistle *(Cirsium arvense)* and unexpanded flowers of *Verbascum thapsus.*
———*fennica*—10th August; one specimen at rest in the Montebello Gardens.
——— *gladiaria. N. sp.* Morr.–Sept. 5th; not unfrequent at sugar and light.
——— *tesselata*—29th June; bred from larva found in abundance at the roots of *Malva rotundifolia* in May; afterwards to 2nd of July, swarming; at sugar, rest and at lime blooms. Many remarkable aud beautiful varieties.
——— *Cochrani*—27th July; bred afterwards; common; at sugar and rest to September.
———*saucia*—14th August; not uncommon; at sugar.
——— *suffusa*—2nd June to October; swarming at sugar, flowers and light.
——— *venerabilis*—6th September; not uncommon; at light and sugar; also bred.
Aplecta pressa. N. sp—6th July; lime blooms and at rest; several.
——— *herbida*—27th June to September; common at rest; less frequent at sugar.
——— *nimbosa*—6th August; rare; at sugar.
——— *latex*—30th May to June; not uncommon; at rest.
Ammoconia badicollis—31st July; rare; at sugar.
Hadena subjuncta—2nd July; rare at sugar.
——— *vicina. N. sp.*—4th June; rare at sugar.
——— *confusa*—8th May; rare at palms.

Hadena albifusa—5th June to August; common at rest, flowers and sugar.
——— *claviplena*—9th July; rare at sugar.
——— *xylinoides*—23rd May to June; common at rest and at sugar; a second brood in August, smaller in size.
Dianthoecia meditata—11th August; not rare at sugar and at rest.
Mamestra arctica—22nd June to August; swarming at rest, and at sugar and lime blooms; also at light; bred from warty larvæ found under stones in May.
——— *devastator*—24th June to September. By far the most common moth here; a perfect nuisance at sugar.
Apamea jaspis—30th May to July; common at rest and at sugar.
——— *finitima*—10th June; common at rest; rarely at sugar.
——— *mactata*—31st August to September; common at rest and sugar.
——— *modica*—7th July to September; very common at rest and sugar.
——— *reniformis*—31st July to September; not uncommon at sugar.
Celæna herbimacula—23rd June to October; seemingly a succession of broods; very common at sugar, light and rest.
——— *chalcedonia*—25th June; rare at sugar.
Dipterygia pinastri—14th June; not common at sugar and at rest.
Xylophasia apamiformis—16th June; frequent at sugar and at rest.
——— *sputator*—4th July to September; common at sugar and bred.
——— *dubitans*—12th July; rare; one specimen in spider's web.
——— *lignicolor*—27th June to August; common at sugar and lime blooms.
——— *verbascoides*—9th July; rare; one specimen at sugar.
——— *sectilis*—12th June to August; not uncommon at sugar and rest.
——— *cariosa*—6th July; rare; one specimen at rest.
Cloantha ramosula——18th May; rest hybernated; 1st September, fresh specimen at rest; rare.
———*vomerina*—8th May; rare at Sallow Palms (*Salix caprea*).
Phlogophora periculosa—6th August; rare at sugar.
——— *iris*—9th June; rare at sugar.
Euplexia lucipara—2nd June to August; not common; at rest and sugar.
Nephelodes violans—1st September; common at light and sugar, but always in bad condition.
Luceria loculata—27th June; not uncommon at sugar.
Hydræcia lorea—16th June to July; common at light, flowers and sugar.
———*nictitans*—21st July to August; common at sugar; neither so variable nor so beautiful as European specimens.

(To be Continued.)

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 249, vol. vi.)

Since the preceding portion of this paper, as well as much of that which follows in this and some following numbers, were placed in the hands of the Editor of the CAN. ENT., I have received from Mr. Belfrage another collection of Tineina from Basque County, Texas, containing additional specimens of species found in the first collection, and several new species. The only species contained in this last collection which has been previously described from more Western localities, and were not contained in the former collection, are *Gelechia solaniella?* Cham. and *Strobisia iridipennella* Clem. and *Theisoa bifasciella*. The specimens of the first named differ somewhat from bred specimens from Kentucky and Missouri, so that I mark them doubtfully as of this species; I however believe them to be the same. *Strobisia venustella* Cham., I am now satisfied, is a synonym for *S. iridipennella* Clem. Because of the presence of several brilliant blue spots on the wings of my specimens, not mentioned in Dr. Clemens' description, I was led to believe that they belonged to a different species. But the individuals vary in this respect. Mr. Stainton, in his edition of the Clemens' papers, has corrected Dr. Clemens' description so far as it differed from specimens in his collection. Dr. Clemens' description was probably correct of the specimens observed by him. The single Texas specimen in this collection has a less number of the blue spots than any other that I have seen. I insert here a few descriptions of species contained in Mr. Belfrage's last collection, which are new, reserving for a future paper other new species and notes on those described in papers already in the hands of the Editor. The second collection was made in Basque County, Texas.

HYPONOMEUTA.

H. 5-punctella. N. sp.

Snowy white. On the forewings are five distinct, circular, black spots, three of them forming a line along the middle of the wing, the other two being in the dorsal half of the wing, one of them opposite the space between the first and second, and the other opposite the space between the second and third spots. The first spot is placed about the basal

fourth, the second about the middle, and the third about the apical fourth. Hind wings silvery white, tinged with gray. *Al. ex.* 3/4 inch. Basque Co.

H. apicipunctella. N. sp.

I fear this specific name may at times prove mis-leading, as the apical black spot is small and may not be observed if the specimen is at all denuded.

Silvery white, the hind wings silvery, tinged with gray. There is a distinct black spot on the middle of the anterior margin of the thorax, one on each side of the tip of the thorax, and another on each side before the tip, and one on the patagia. On the forewings there is a black spot at the base, above but near to the fold, a little further back is one on the dorsal margin; above the fold and nearly opposite the second of these wing spots, are two others, one a little further back and nearer to the fold than the other. Further back on the fold is another, near to which, above the fold and about the middle of the wing, is another circular spot, larger than the others. Behind this spot are four others, forming a trapezoidal figure, and behind these, in the apical part of the wing, is a longitudinal spot or dash; there is also a similar dash on the dorsal margin, just before the ciliae. There are six black spots at the base of the dorsal ciliae, and five narrow black dashes along the base of the costal ciliae, and *there is a black spot at the tip of the ciliae* behind the row at their base. *Al. ex.* 11/16 inch. Basque Co.

GRACILARIA.

I observe that by some error this generic name is in some preceding papers spelled with two l's. *Gracilaria* is the correct form of the word, and the same form is in use for a genus of Marine Algæ. I am not able to state which genus the name was first applied to. I will add here that the name of one of Dr. Clemens' genera *Aspidisca* is pre-occupied among the Infusoria *(Aspidisca, Ehrenberg.)*

G. Belfragella. N. sp.

Antennae purple brown; face and palpi white; the second joint of the maxillary palpi and the third joint of the labial pair tipped beneath with brown. Thorax and wings purple brown. The costal triangle is very pale lemon yellow, and reaches the fold, where it is somewhat trun-

cate; posteriorly it extends as a rather wide band along the costal margin to the ciliae. Sides of the thorax purple brown. Anterior and middle legs purple brown, with white tarsi; hind legs whitish, except the apical halves of the femora, which are purple brown. *Al. ex.* $\frac{5}{16}$ to $\frac{7}{16}$ inch. Basque Co.

NÆRA, *gen. nov.*

Second joint of the palpi with a projecting tuft, more nearly like that of a *Plutella* than that of any other genus known to me. When the tuft is removed from the second joint, the palpi resemble those of a *Laverna*, for which I at first mistook it, and the deception is the more readily believed because of the tufts of raised scales on the wings. The form and neuration of the hind wings is exactly that of *Cleodora cytisella*, as figured in *Ins. Brit., v. 3*, while the fore wings, though a little narrower than those of *Gelechia rufescens loc. cit.*, have very nearly the same neuration. The antennae are more than half as long as the fore wings, with the basal joint short and hardly larger than the stalk, which tapers from the middle to the tip. The palpi are somewhat recurved, and long enough to reach the vertex, with the terminal joint a little fusiform, with the tip blunt. The head resembles that of a true *Laverna*, but the face is not so full.

N. fusco-cristatella. N. sp.

Head and face white; second joint of the palpi and the tuft more or less externally marked with dark brown, and the third joint with two brown annulations, one narrow and indistinct about the middle, and a wide one before the apex. The face is marked a little with brown about the base of the antennae, which are white, annulate with brown, and the sinal basal joint has two distinct brown annulations, one about its base, the other before its apex. The upper surface of the thorax and fore wings is ash gray, sometimes nearly white, and sometimes suffused with ochreous and brown, and when the thorax and base of the wings are not so suffused, then the white passes gradually into the gray or ochreous brown, deepening gradually to the apex. To the naked eye the greater number of individuals appear to have the thorax and basal fourth and the apical third of the fore wings ochreous or reddish brown, while the middle portion of the wings is white or yellowish white. There are on the fore wings four brown spots, the first placed on the base of the costa, with the others following in a line departing a little from the extreme costa;

opposite the space between the two last of these spots, and beneath the fold, is another small brown spot on the base, near the dorsal margin; there is also one on the apex of the thorax, and sometimes three or four obscure ones on the thorax before it. Beneath the fold, close to, but not touching it, at about half the wing length, is a tuft of raised scales, the anterior portion being brown and the posterior white. Behind the discal cell are two other tufts, opposite to each other, one within the costal margin and the other within the dorsal margin, and behind the space between these tufts are three or four narrow, longitudinal streaks of white and dark gray, and the dorsal margin behind the tuft is whitish. Behind the costal tuft is an oblique white costal streak, passing backwards *towards* a small whitish spot in the dorsal ciliae, and margined decidedly behind by dark brown; behind the margin of this streak the costal margin along the base of the ciliae is reddish ochreous, with three or four small white spots on the base of the ciliae, which are grayish brown. There is also a small brown spot on the costa just before the middle, and one on the disc behind it. *Al. ex.* 3/8 to 1/2 inch. Waco and Basque Co.

BUTALIS.

B. buristriga. N. sp.

Dark purple brown, with a narrow yellow streak along the middle of the fold, which is sometimes interrupted. *Al. ex.* 1/2 inch. Season, October.

B. dorsipallidella. N. sp.

Dark purple brown; the base of the primaries and the dorsal margin to the fold, pale ochreous yellow faintly suffused with purplish. *Al. ex.* 1/2 inch. Season, April.

B. immaculatella. N. sp.

Dark bronzy brown, somewhat iridescent; the second joint of the palpi a little pale beneath. *Al. ex.* 1/2 inch. Season, April.

The two following species I have been unable to separate from *Butalis* otherwise than by the ornamentation, which is altogether different from that of the other species.

B. plausipenella. N. sp.

Very pale ochreous yellow, nearly white; the second joint of the antennae stained with fuscous towards the apex, and a fuscous annulus

around the middle of the third joint. Primaries obscurely streaked with pale fuscous between the veins. *Al. ex.* ½ inch.

B. albapenella. N. sp.

White, with a very faint ochreous tinge. *Al. ex.* ⅓ inch. Season July

GLAUCE, *gen. nov.*

The species for which this genus is erected is congeneric with, or, at least, is closely allied to some species of *Gelechia*, and but for the peculiarities of the secondaries, I should have placed it in that indefinite group.

Head and face smooth; scales appressed; face broad, somewhat retreating; antennae more than half as long as the wings, stalk simple, basal joint elongate but not enlarged; tongue moderately long, scaled; no maxillary palpi; labial palpi recurved, divaricating, overarching the vertex; third joint pointed, nearly as long as the second, which is scarcely thickened beneath.

Primaries lanceolate; cell closed, short and narrow; costal vein short; the subcostal sends two veins to the costal margin from behind the middle, one from the end of the cell, and the apical branch, which is trifid, the first branch going to the dorsal margin, the other two to the costal margin; the median subdivides into four branches from the hinder part of the cell; the discal is short, with no branch, and the submedian is furcate at the base.

Secondaries a little narrower than the primaries, with the posterior margin excised beneath the tip; *the costal margin from the base to the middle is armed with a row of stiff, sharp, two-edged bristles, passing gradually towards the middle of the costa into large scales*, and is slightly excised from the middle to the tip. *The cell is closed, short and wide*, the discal vein being placed about the middle of the wing, long and without any distinct branch. The subcostal is straight and furcate before the tip, one branch going to each margin. A branch of the discal vein or a fold is faintly indicated, and is continued through the cell to the base; the median gives off a short branch before its middle, and three from the end of the cell; submedian somewhat distinct, internal obsolete; there is also a faintly indicated vein or fold through the middle of the cell from the base, touching the median between its last two branches.

G. pectenalœella. N. sp.

The ground color appears to be pale yellowish, but it is almost entirely obscured by dense fuscous dusting and fuscous spots; apex of the primaries more deeply fuscous; head a little iridescent; antennae annulate with sordid yellowish. *Al. ex.* $\frac{7}{16}$ inch. Season, September.

(To be Continued.)

THE MEXICAN HONEY ANT.

(Myrmecocystus Mexicanus.)

BY THE EDITOR.

During the summer of 1873 we received from an esteemed correspondent, Mr. Jacob Krummeck, residing in Santa Fe, New Mexico, several packages of this most curious insect, accompanied by letters giving interesting details of their habits and of the uses to which the

Fig. 1.

honey they secrete is put. In fig. 1 our readers will find excellent figures of a worker, a honey secreter and cocoons, commonly known as eggs, drawn by Miss Peart, of Philadelphia. At the meeting of the American Pharmaceutical Association, held in Baltimore in 1873, we presented a paper on this insect, from which we quote the following:

Very little can be found in Entomological works relating to this insect. Some thirty years ago, a Belgian naturalist, M. Wesmael, received specimens from a party travelling in Mexico, and published some observations on it in the fifth volume of the Bulletin of the Royal Academy of Brussels, giving it the name of *Myrmecocystus Mexicanus.* The discoverer found them very common near the town of Dolores, where they were known under the native name of Busileras. He states that they live in underground nests, which are not distinguishable from without. In early life none of these insects present any unusual distension of the body, but when arrived at a certain period of maturity some individuals begin to

show a distended abdomen, which after a time becomes swollen into a comparatively immense sphere, produced by the distension of the membrane connecting the abdominal segments, this sphere or sac being filled with a sort of honey. Another class of individuals in the community, raised from the same brood of eggs, manifest no tendency of this sort, but retain the usual normal form of abdomen. Both these classes of ants are neuters. When the sacs of the honey-producers are full they are somewhat like a transparent bubble of a yellowish color. They are unable in consequence of their immense burden to leave their nests, and are necessarily almost inactive, remaining fixed or suspended to the floors of the galleries of their nests elaborating this honey, which, it is said, they subsequently discharge into cells similar to those of the hive. It is also stated that the women and children dig them up and enjoy their honey, and that it is by no means unusual for these insects to be served at table, the head and thorax with the legs being removed, when the distended abdomens are eaten as a delicate sweetmeat. The neuter ant without the distended abdomen is the active worker in the establishment.

Our friend Krummeck informs us that they are found in considerable numbers in the mountains around Santa Fe; that the honey ants are unable to move and are fed by the active workers. He says, "I have sat by their nests and watched them working, for, at one time, six or seven hours; the workers carry leaves of different plants home, to feed, as I suppose, the others that produce the honey." Mr. Krummeck has tried to procure us specimens of the plants on which this insect feeds, but has not yet succeeded. He does not think that the honey is deposited by these honey ants in cells, as has been stated, but that they keep the fluid in their bodies, and the workers feed from them, and that when the honey in the sac of an individual is exhausted, it dies. In reference to the uses made of this honey in New Mexico, he says that the natives make a very pleasant drink of it, which is made in the proportion of three or four drachms of the honey to six ounces of water. It has no commercial value, is not brought to market, but simply made for their own use. They use this drink among themselves in the mountains in cases of fever, where medical attendance cannot be obtained. The honey is also used by them as a cure for eye diseases, especially for cataract.

Being very anxious to see this insect alive, Mr. Krummeck very kindly did his best to gratify us in this particular, having twice sent us boxes of living specimens, but the unavoidable delay and knocking about

attendant on so long a journey by mail, has in each case resulted in the death of all the ants before they reached their destination, the packages being literally soaked with the honey which had escaped from their bodies.

ON SOME OF OUR COMMON INSECTS.

THE GREEN GRAPE-VINE WORM—Amphipyra pyramidoides.

BY THE EDITOR.

The caterpillar of this species, shown in fig. 2, is occasionally very destructive to the grape vine, with us more particularly affecting those

Fig. 2.

grown under glass, although it is not by any means confined to this plant, feeding readily on the plum, pear, thorn, raspberry and poplar. The larva is found early in June, and is full grown usually about the middle of the month. Its length is from one and a quarter to one and a half inches, the body tapering towards the front and thickened behind. The head is rather small, flattened in front, and of a whitish green color, with the jaws or mandibles tipped with black. The body is whitish green, a little darker on the sides, with a white stripe down the back, a little broken between the segments and widening somewhat behind. There is a bright yellow stripe on each side close to the under surface, which is most distinct on the hinder segments, and a second one of the same color, but fainter, half way between this and the dorsal line; this latter is more distinct on the posterior portion of the body, and follows the peculiar prominence on the twelfth segment, as shown in the figure. The under side of the body is pale green.

When full grown, this caterpillar changes to a dark brown chrysalis, either at or a little under the surface of the ground, from which the moth

appears in the latter part of July. This moth, which is represented in fig. 3, measures, when its wings are expanded, about one and three quarter

Fig. 3.

inches; the fore wings are dark brown, shaded with paler brown, and with dots and wavy lines of dull white. The hind wings are reddish with almost a coppery lustre, becoming brown on the outer angle of the front edge of the wing, and paler towards the hinder and inner angle. The under surface of the wings is much lighter in color than the upper: the body is dark brown, with the hinder portion banded with lines of a paler hue.

CORRESPONDENCE.

DEAR SIR,—

Mr. A. R. Grote has published a paper in the "Bulletin of the Buffalo Society of Natural Sciences," in which some statements are made which call for correction on my part. I shall not allude to his personal remarks, similar in character to those which he has made concerning others who have ventured to criticize his scientific work or to correct his mistakes; but to the palpable blunders into which he has fallen with respect to some species recently described by me in the Proceedings of the Boston Society of Natural History. The following is a list of those of my species which were corrected (sic) by Mr. Grote: *Hadena rasilis*, *H. vulgivaga*, *Glaea sericea*, *Agrotis exertistigma*, *Xanthoptera nigrocaput*, *Copipanolis vernalis* and *Mamestra illabefacta*.

Mr. Grote states that my *H. rasilis* is a re-description of *Elaphria grata* Hübn., referred by him in the List to Caradrina! If Mr. Grote will examine Hübner's figure, he will see that it represents a much larger, stouter, and entirely different insect. Mr. Grote has apparently overlooked

the fact that it is an excellent representation of the common species determined as *Taeniocampa oviduca* in collections; this, therefore, should be considered a synonym of *grata*, and *rasilis* remain a distinct species of *Hadena*.

My comparisons were made with two copies of the "Zutrarge;" a fine one in the library of Mr. S. H. Scudder, and another more coarsely colored in that of Harvard University.

Mr. Grote remarks that my *Hadena vulgivaga* is probably a re-description of *H. apamiformis* Guen. I am perfectly well acquainted with Guenee's species, and *vulgivaga* has not the slightest resemblance to it; it is, as I mention in the description, a new species allied to *H. rurea*.

Mr. Grote states that my *Glaea sericea* seems to be founded on a specimen sent him for determination, and which he considered identical with his *Orthosia ! apiata*. I never sent a specimen of *Glaea sericea* to Mr. Grote, and the species is entirely distinct from *apiata*. I did send Mr. Grote a variety of *apiata* for comparison with his type, and this he has probably confounded with *sericea*.

Mr. Grote remarks that my *Agrotis exertistigma* is probably only a Californian variety of *alternata*. After re-examining my material, consisting of two specimens of the former species and about twenty of the latter from Nebraska to Canada, I do not see any reason to change my opinion, but I should be happy to do so if Mr. Grote can prove the species identical.

Mr. Grote refers my *Xanthoptera nigrocaput* as a synonymn of *X. Ridingsii* Riley. The fact is that the author's copies of the first signature of Mr. Riley's paper, containing the name and a few lines of the description of his new *Xanthoptera*, were distributed some time before my paper appeared (I did not receive a copy, however, until January, 1875). The second signature, containing the larger part of the description, has not yet appeared, to my knowledge (Jan. 25th, 1875.)

Mr. Grote's attention having been called by me to his erroneous arrangement of the species of *Xanthoptera*, he at once improves the opportunity to found a new genus, *Exyra*. It is obvious that this genus (even if a needful one) can not stand, as it is not accompanied by a word of generic diagnosis.

In a similar manner he founds a new genus for my *semiapata*, after having only a month before (see Proc. Ac. Nat. Sci., Phil., 7, 206, 1874) entirely mistaken its generic characters and placed it in *Apamea*.

Mr. Grote states that my *Copipanolis vernalis* is a re-description of his *Eutolype Rolandi*. The fact is, Mr. Grote has priority by one day (his paper was read Nov. 3rd, and mine Nov. 4th.) In the same papers were published *Apamea purpuripennis* Grote and *Orthosia baliola* Morr.; these species are synonyms and Mr. Grote's name has priority.

Lastly, Mr. Grote states that I have re-described Dr. Harvey's *Mamestra lilacina*. On the appearance of Dr. Harvey's description, I gave Mr. Grote a typical specimen of my species, and requested him to compare with the type of Dr. Harvey's species, and give his opinion. In his letter (which I should be glad to show to any one interested) he states unequivocally that the species are distinct, and on his word I published my description of *illabefacta*.

In this letter I have only referred to those mistakes of Mr. Grote's which, if allowed to remain unanswered, would create a wrong impression in regard to my work. I make no attack upon him or upon his work, although, if I were desirous of doing so, material would not be lacking.

The identification of specimens of the common *Agrotis messoria* Harris (already once re-described by Messrs Grote & Robinson as *A. repentis*) with *A. lycarum* Evers., a Siberian species, is an instance in point. I am yours respectfully,

H. K. Morrison, Cambridge, Mass.

GLAUCOPSYCHE COUPERI Grote.

Dear Sir,—

As this butterfly has lately been figured as *Pembina* Edwards, the following remarks will settle the distinction between the two species :

"With regard to the *Lycaena* from Anticosti, I presume Mr. Scudder is correct. The original *Pembina* came from Lake Winnipeg, a single specimen or a single pair, several years ago. These types were afterwards lost in a box of insects sent by me to California. I had forgotten them, and some how, another species had been assumed to be *Pembina* by Scudder and others, and I had fallen into the error myself of thinking with them that *Pembina* was allied to *Lygdamus*. I discovered the fact last year, and called Mr. Scudder's attention to it. I think this *Couperi* was what had been thought to be *Pembina*, and Grote was correct in naming it *Couperi*."

Mr. Scudder writes October 10th, 1874, as follows:

"I formerly believed this to be *Pembina*, having received it from Edwards with that determination. I therefore named some of your first lot (as Mr. Mead says) *Pembina*. Afterwards I received a lot from your subsequent journeys, sent me by Grote. The specimens were poor and much rubbed, and I thought when I determined them to be distinct from the so-called *Pembina*, that ♂ and ♀ alike had a broad marginal band. Mr. Edwards was the first to discover his own error, and drew my attention to it. We do not know *Pembina;* it is temporarily lost to science, but it will turn up one of these days. From Edwards' description and the context, it is plain that your butterflies are *not Pembina*. After *Couperi* was described, I saw many other and fresher specimens, and then discovered my mistake (accepted and published by Grote) about the distinction between your two lots of butterflies, and found that although Grote was in error in describing *Couperi* as distinct from the so-called *Pembina*, the *name* must stand because the first one, apart from *Pembina*, was given to an insect which was not *Pembina*.

"There are but two known species of *Glaucopsyche* in America:

"1. *Lygdamus* of the South.

"2. *Couperi* of the North, long supposed to be *Pembina* Edw., which however belongs to a distinct group."

PAPILIO BREVICAUDA, Saunders.

I have received specimens of this butterfly from Percé, district of Gaspé, the north shore of the Gulf of St. Lawrence.

Wm. Couper, 67, Bonaventure Street, Montreal.

COLIAS PHILODICE.

Dear Sir,—

Mr. W. H. Edwards informs me that Mr. Mead has determined by experiment that this species becomes crimson on the contact of the wings with cyanide in the collecting bottle. This accounts for a supposed variety of *philodice* sent me by an Entomological correspondent in good faith as having been collected by her. The lady reported that she had not particularly noticed the specimen at the time of capture, but on setting

her specimens she found that one of them had crimson patches on the wings. I have not seen any mention of the fact before in print, and as the illusion is very complete, owing to the brilliancy and thoroughness of the color, its true origin should be brought to notice, that others may not be deceived thereby. A. R. GROTE, Buffalo, N. Y.

DEAR SIR,—

On page 117, of vol. vi of your journal, Mr. Grote kindly furnishes us with a list of all the species of Noctuidæ common to this country and Europe, known to him. The following may, very safely, be added :

Ichthyura inclusa—Prob. *I. inversa* Packard.
Calocampa vetusta—New York, New Jersey, &c.
Graphiphora plecta Ochsen., N. Y., N. J.
Agrotis ypsilon = *A. suffusa; ypsilon* has priority.
Hadena chenopodii—New York, Michigan, New Jersey.
Calligenia miniata—New York.
Plusia urticæ—Penn.
Eugonia magnaria—Either *E. autumnalis* or *E. alniaria*, I forget which.

The last three I have received from Russia.

It may also interest your readers to know that *Danais archippus* is found in Queensland, without any variation that I can see. There is, too, a very suspicious resemblance between some of the Labrador species and those of Europe—for instance, between *C. phicomenes* and *C. nastes;* also between *C. pelidne* and our *C. philodice*. However, these require further investigation.

W. V. ANDREWS, New York.

DEAR SIR,—

A note on p. 92, vol. vi, CAN. ENT., states that Mr. Grote, of Soc. Nat. Sci., Buffalo, received specimens of Coliadae taken by me in 1873, on Anticosti. I wish this error corrected, as that gentleman had no *Colias* from the collection made that year on the island.

WM. COUPER, 67 Bonaventure St., Montreal, P. Q.

BOOK NOTICES.

The Distribution of Insects in New Hampshire, by Samuel H. Scudder—a chapter from the first volume of the final report upon the Geology of New Hampshire, pp. 53, with two plates and several wood-cuts.

The species of the Lepidopterous genus Pamphila, by Samuel H. Scudder, pp. 12, with one colored plate and one uncolored, from the Memoirs of the Boston Society of Natural History,

We have been favored by the author with copies of both the above papers, for which we tender him our sincere thanks. The first is a valuable contribution to the Entomology of New Hampshire, treating more particularly of the Butterflies and Gryllides. The second, besides valuable notes on the species enumerated, contains convenient tables, by the use of which the males and females of the various species may be readily determined. The colored plate, containing two figures, is a chromo-lithograph, nine stones having been used in producing the tints. The execution of this plate is excellent; the artists are Messrs. Sinclair & Son, of Philadelphia. The second plate illustrates the abdominal appendages of the males of eight species.

Entomological Contributions, No. 3, by J. A. Lintner, Albany, N. Y., with two photograph plates illustrating 12 species of Cucullia. We have already noticed this work in vol. 6, p. 120; the addition of the two excellent plates in the present copy adds much to its value.

BOOKS RECEIVED.

Note sur l'oeuf et le Jeune age de la Chenille D'Eneis aello, par Samuel H. Scudder, 8vo., pp. 4, with one plate.
Supplement to the List of North American Noctuidæ, by A. R. Grote, from Bul. Buf. Soc. Nat. Sci. pp. 15.
Proceedings of the Academy of Natural Sciences, Philadelphia, part 2, April—September, 1874, with three plates.
On the Habits of Some American Species of Birds, by Thos. G. Gentry, from the Proc. Acad. Nat. Sci., Philadelphia, 8vo., 14 p.
Proceedings of the Boston Society of Natural History, vol. xvii, part 1, May—October, 1874, pp. 128.
First Annual Report of the Ross County Horticultural Society, Chillicothe, Ohio.
Third Annual Report of the State Pomological Society of Michigan.
Monthly Report of the Department of Agriculture, Nov and Dec. 1874.
Bul etin Buff. Soc. Nat. Sci., vol. 2, No. 3, September, 1874.
Nature to Jan'y 14, 1875.
Science Gossip to Jan'y, 1875.
The Zoologist to Jan'y, 1875.
Newman's Entomologist to Jan'y, 1875.
The Scottish Naturalist, Jan'y, 1875.
Journal of the Agricultural and Arts Association, November, 1874.
Journal of Education to Dec., 1874.
The Canada Farmer, Toronto, to Jan'y, 1875.
Psyche, The Indiana Farmer, The Prairie Farmer and Le Naturaiste Canadien.

The Canadian Entomologist.

VOL. VII. LONDON, ONT., FEBRUARY, 1875. No. 2

CAPTURES OF NOCTUIDÆ AT ST. CATHARINES, ONT.

BY GEO. NORMAN, ST. CATHARINES, ONT.

(Concluded from Page 6.)

Hydræcia sera—2nd July ; very common ; at sugar and light.
Gortyna cataphracta—September 22nd ; bred in quantities from larvæ in the stems of *Arctium lappa* ; also at rest.
Scolecocampa ligni—1st July ; rare ; at light.
Leucania Henrici—15th April ; bred.
————*pallens*—2nd July ; not common ; lime blooms.
————*phragmitidicola*—7th June ; not uncommon ; at light and sugar.
————*commoides*—2nd July to August : common ; at lime blooms, sugar and light.
————*unipuncta*—2nd June ; very common ; at sugar and light.
————*pseudargyria*—11th July ; rare ; at sugar.
Ufeus satyricus—20th July ; rare ; at sugar.
Caradrina miranda—2nd June ; not uncommon ; at light.
Amphipyra pyramidoides—24th July to August ; common ; at sugar.
————*tragopoginis*—13th July ; not uncommon ; at sugar.
Ceramica picta—7th June ; bred ; larvae afterwards on cabbages.
Matuta Catharina—*N. g. et sp.*—Dec. 29th, 1873, wing in spider's web 11th May, rare ; at sallow palms.
Perigrapha Normani. *N. sp.*—11th May ; rare ; at sallow palms ; June, one at sugar.
Tœniosca gentilis. *N. g. et sp.*—30th June ; very common ; at lime blooms, sugar and rest to August.
————*perbellis*. *N. sp.*—2nd July ; rare ; at rest.
Tæniocampa alia—2nd May to June ; very common ; at palms.
———— *oviduca*—30th May ; not unfrequent ; at light.
Orthodes infirma—29th June ; not unfrequent ; at sugar and light.
————*cynica*—8th June ; rare ; at sugar.

Cirrhædia pampina—1st September; common all the month; at sugar.
Cerastis decliva—21st September to October; common; at sugar.
——— *inulta*—18th September; rare; at sugar.
Orthosia infumata. N. sp.—18th August; not uncommon; at rest and sugar.
Xanthia ferruginoides—15th September to October; very common; sugar and with net.
——— *euroa*—9th September; not rare; at rest.
Scopelosoma Morrisoni—4th May; hybernated; common on palms; 18th October, fresh brood; rare; at rest.
———*devia, n. sp.*—10th May; rare; at sallows.
Gonoptera libatrix—4th May; hybernated; at rest. Fresh brood—June to October; not unfrequent; at sugar.
Xylina petulca—5th May; hybernated; at palms. Fresh specimens—11th September; common; at rest and sugar.
———*ferrealis*—5th May; hybernated; at palms. Fresh brood—19th September; rare; at rest.
——— *Bethunei*—2nd May; hybernated; at palms. Fresh brood—7th September to October; common; at rest and sugar.
——— *disposita*—5th May; hybernated; at palms. Fresh brood—September to October; not uncommon; at rest and sugar.
——— *cinerea*—16th September; at rest and sugar; not rare.
——— *laticinerea*—2nd May; hybernated and very common; at palms and sugar. Fresh brood—seems later than the preceding species; 8th October; very numerous; at sugar and rest. I never took *cinerea* in the spring.
——— *tepida*—8th October; rare; at rest.
——— *pexata*—3rd May; hybernated; at palms. Fresh brood—16th September to October; frequent; at rest and sugar.
Calocampa nupera—10th May; hybernated; single specimen; at light.
Cucullia asteroides—7th June; common; at flowers and rest.
Crambodes talidiformis—13th June; rare; with net at raspberry blooms.
Adisophanes miscellus—2nd May; rare; at rest.
Plusiodonta compressipalpis—24th June; rare; with net over *Philadelphus coronarius.*

Placodes cinereola—19th June; not uncommon; at light.
Abrostola ovalis—16th August; rare; at light. Many larvæ of some *Abrostola* afterwards beaten from nettles.
Plusia aerea—20th June; rare; at light.
———*balluca*—June; rare; at light.
———*precationis*—3rd Juue to October; very common; at flowers and at rest.
———*simplex*—1st June; rare; with net over Lilac blooms.
———*mortuorum*—2nd August; rather scarce; at rest and over Thistle flowers *(Cnicus arvensis.)*
———*8-scripta*—1st September; rare; at rest.
———*ampla*—21st July; rare; with net over *Cnicus arvensis.*
Heliothis exprimens—5th June; rather frequent; over Lilac and *Weigelia rosea.*
Acontia candefacta—6th September; rare at light.
Oligia versicolor. N. g. et n. sb.—Rare; 23rd June; at rest.
Leptosia concinnimacula—1st June; common; at rest and at sugar.
Erastria carneola—1st June to September; very common; at rest and at sugar.
——— *synochitis*—25th June; rare; at rest.
——— *nigritula*—15th June; common at rest to July.
——— *muscosula*—9th June; very common; at rest and at sugar.
Chamyris cerinthia—29th June; rare; one pair at rest.
Drasteria erichtea—May 10th; common; at light and sugar to August.
————*erichto*—12th June; common; at rest, sugar and light.
Parallelia bistriaria—8th June; common; at rest and at sugar.
Parthenos nubilis—3rd June to September; very common; at rest and at sugar.
Catocala epione—27th July; rare; at sugar.
————*insolabilis*—29th June; rare; at rest.
————*residua*—1st August; not common; at sugar.
————*relicta*—4th August; common to September; at sugar and rest.
————*unijuga*—18th August; not rare; at sugar.
————*Briseis*—5th August to September; not uncommon; at sugar and at rest.
————*parta*—20th July to September; common; at rest and sugar.
————*ultronia*—11th July to August; very common; at rest and sugar.
————*concumbens*—4th August to September; very common; at rest and sugar.

Catocala amatrix—27th August to September; common; at rest and at sugar.
————*cara*—20th August to September; less common than last; at sugar and at rest.
————*innubens*—2nd August; very common; at rest and at sugar.
————*D. C.* var. *scintillans*—8th September; rare; at sugar.
————*ecrogama*—21st July to September; very common; at rest and at sugar.
————*neogama*—24th July to August; common; at sugar and at rest.
————*piatrix*—15th August; not rare; at sugar.
————*habilis*—20th August not uncommon; at sugar.
————*cœlebs*. *N. sp*—18th August; rare; one specimen at sugar; Strathsallow.
————*Clintoni*—11th July; rare; one specimen at sugar.
————*polygama*—8th Jnly to August; very common; at sugar and at rest.
Homoptera lunata—2nd May to June; common; at rest and at sugar.
———— *Saundersii*—17th June; common; at rest and at sugar.
———— *edusa*—11th August to September; not uncommon; at sugar and at rest.
Ypsia undularis—23rd May to June; common; at sugar and at rest. Apparently a second brood in August.
Pseudaglossa lubricalis—10th July; common; at sugar and at lime blooms.
Epizeuxis Americalis—9th July; common; at sugar.
Chytolita morbidalis—23rd June; common; at sugar.
Palthis angulalis—24th June; rare; at sugar.
Bomolocha baltimoralis—21st June; very common; at rest and at sugar.
———— *abalienalis*—14th June; common; at rest and at sugar.
Hypena subrufalis—29th June; not common, at rest.
Platyhypena scabra—23rd July to October; common; at rest.

THE *Cossus* of the Greeks and Romans, which, at the time of the greatest luxury among the latter, was introduced at the tables of the rich, was the larva, or grub, of a large beetle that lives in the stems of trees, particularly the oak; and was, most probably, the larva of the Stag beetle, *Lucanus cervus.—Curious History of Insects.*

PRELIMINARY LIST OF THE NOCTUIDÆ OF CALIFORNIA.

Part III.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

21. Mamestra cinnabarina Grote *(ante.)*

Under the number 5574, Mr. Hy. Edwards sends six specimens which, in their yellow rufous color, resemble the European *M. fasciuncula;* they are distinguished by the paler hind wings, the white reniform and the absence of white outer shading to the t. p. line. The Californian species may be held to represent the European *M. strigilis.*

50. Zosteropoda hirtipes Grote *(ante.)*

Under the number 4408, Mr. Hy. Edwards sends the female of this interesting form. The hind wings are fuscous in the disc with a shaded fascia; they are without the gathering of longer hair on the veins, which characterize the male. The tibiæ are clothed with sparse and rather long hair, not tufted as in the male. The long pointed palpi are characteristic and the shape of the primaries and ornamentation are as in the male. By a clerical error I have given the eyes as "naked" in my original generic description. They are hairy, as in *Heliophila*, and this character, with the tufted legs, induced my approximation of the genera in the "List of the Noctuidæ of North America."

51. Agrotis euroides Grote, Proc. Acad. N. S., Phil., 1874, 202.

California, Mr. Behrens, No. 66; Vancouver, Mr. Hy. Edwards, No. 5576.

52. Agrotis gravis Grote, Bull. B. S. N. S., 2, 155.

Mendocino, Mr. Behrens, Nos. 83, 132; California, Mr. Hy. Edwards, No. 2622.

This species varies in tone. In two ♀ specimens the fore wings are yellow brown, with the stigmata concolorous. A ♂ specimen sent by Mr. Hy. Edwards from Vancouver, No. 5607, may belong here; the markings are obliterate and the primaries more rounded.

53. Agrotis lagena Grote.

♂. The specimen is much larger than *A. Hollemani*, hind wings paler and the ornamentation differs in detail, with a general great similarity. The resemblance to the Coloradian *Oncocnemis Chandleri* is so perfect that they can hardly be separated. Nevertheless, the *Oncocnemis* has unarmed tibiae, the fore tibiae alone with a terminal spine, whereas the *Agrotis* has all the tibiae armed, the fore tibiae with a double row of spines. The insect is also more whitish and larger. The antennae are simple, the eyes naked and lashed. Whitish gray, with longitudinal interspaceal striations of a darker tint, more prominent terminally. The stigmata are united, the decumbent open orbicular fusing with the reniform, so that a flask-shaped figure is produced longitudinally on the cell. A narrow black basal ray; a terminal series of blackish dots; the nervules accentuated. Hind wings whitish, soiled with fuscous; the nervures marked. Body pale, with a black line on the collar and inner edging to the tegulae. Palpi with the middle joint dark at the sides. Beneath whitish, without markings. Exp. 40 m. m. California, Mr. Hy. Edwards, No. 2256.

54. Agrotis clandestina (Harr.) Grote.

Two specimens from Nevada, under the number 5627, from Mr. Hy. Edwards. One specimen collected by the late Mr. Crotch, Mus. C. Z. Camb., from California.

55. Agrotis alternata Grote, List, p. 10.

Agrotis exsertistigma Morr., Proc. Bost. Soc. N. Hist. 1874, 166.

Mendocino, No. 4 (red label), Mr. Behrens; also sent under the No. 164.

The Californian specimens do not seem to me to belong to a different species. The character of the open orbicular is variable, as in one specimen it is shaped as in my Eastern specimens. The collar is brown in all my remaining Californian specimens. I forwarded Californian examples of this species to Mr. Morrison with this determination, although this circumstance is not mentioned (as should have been done) in Mr. Morrison's paper. This is a very variable species; one Californian specimen has the forewings unicolorous pale brown, without markings. Others have no trace of the claviform, and the median space is not shaded with black, showing that Mr. Morrison's characters for his species are invalid.

56. Agrotis cupida Grote.

A single specimen, without number, sent by Mr. Behrens, belongs apparently to this species.

57. Agrotis subgothica (Haw).

Agrotis jaculifera Guen.

Two fresh specimens sent by Mr. Hy. Edwards under the number 4656, from Vancouver Island. The colors are more intense, else I see no differences from our Eastern material.

22. Mamestra illaudibilis Grote.

Mamestra laudabilis Grote, Ante p. 157.

Both sexes are sent by Mr. Hy. Edwards, from Vancouver Island of this species, which agrees in size with the Eastern *laudabilis*,. and in the lunulations of the median lines. The Western species differs by the tegulae being lined with black, by the median space being wholly black, by the sub-basal and sub-terminal spaces being greenish white, and apparently by the smaller reniform. The bright green tint of *laudabilis* is wanting. The white hind wings have the median nervules soiled with fuscous, and the ♀ has a blackish clouding in the disc. The abdomen is whitish, over fuscous. California ; Vancouver Island, Nos. 5580 and 5581, Mr. Hy. Edwards.

58. Mamestra oliracea Morr., Proc. Bost. Soc. N. Hist., 1874, 143.

To this species I would refer a specimen from Colorado, sent by Mr. Theo. L. Mead, under the No. 41, one from Canada sent by Mr. Saunders, and two from Vancouver Island sent by Mr. Hy. Edwards, under the No. 5580. It is distinguishable from *M. 4-lineata*, *M. laudabilis* and *M. illaudabilis* by the fuscous hind wings, and from the two latter by the greater evenness of the median lines. It is a little larger than any of the other species and bears a certain resemblance to *Hadena modica*. Besides these, five specimens from Vancouver Island seem merely to differ by being a little smaller and more blackish, the fore wings a little shorter, the white subterminal line sometimes showing a ruddy and pale blotch before it, near the internal margin, and in one specimen the t. p. line tinted with reddish. They agree in the fuscous secondaries and in the comparative evenness of the median lines, while the median space varies a little in width. These latter specimens bear the number 5579.

39. Hadena divesta Grote, ante, 215.

Three fresh specimens from Vancouver Island, with the fore wings a little more brown than the Californian type. This handsome species may be recognized by the outward position of the t. p. line and its general straightness. It is allied to *atlantica*, *subjuncta*, etc., but is far prettier and has possibly a nearer European ally.

Vancouver Island, No. 5573, Mr. Hy. Edwards.

59. Hadena indirecta Grote.

This species resembles *H. divesta*, but the t. p. line is exserted on the median nervules, below which it runs inwardly, constricting the median space greatly inferiorly, The fore wings are more purely brown; the median space blackish. The W-shaped mark of the subterminal line obsolete, not distinct as in *divesta*. The orbicular is oblique and narrow, not rounded and full as in its ally. The hind wings are fuscous, with the line not as distinct as in *divesta*. There is a dark mark on the subterminal fold of primaries before the subterminal line, and the fold on the median space is also marked. The median lines are geminate, the veins beyond the t. p. line dark marked. There appears to be a dark basal mark continued along vein 1. *Expanse* 36 m. m. Two specimens, the male with simple antennae, in not the best condition, sent by Mr. Hy. Edwards from Vancouver Island, under the number 5588.

60. Actinotia Stewarti Grote.

The eyes are naked and the species is congeneric with the Eastern *ramosula*. The basal ray is broader. The pale reniform is closed with a V-shaped outward notch, and situated nearer to the t. p. line, which latter is visible as a continuous dark shade, angulate on the veins, from opposite the cell to internal margin, The orbicular is oblique, not longitudinal pale centered, black ringed, small. The wing is shaded with brown below the basal dash, and also below vein 2. The inferior zigzag portion of the t. a. line is visible. Hind wings darker than in *ramosula*, wholly fuscous. *Expanse* 30 m. m.

California, Mr. Hy. Edwards, No. 4567; named for my assistant, Mr. W. W. Stewart.

ON SOME OF OUR COMMON INSECTS.

THE CYLINDRICAL ORTHOSOMA—Orthosoma cylindricum, Fabr.

BY THE EDITOR.

This formidable looking, long-horned beetle, fig. 4, is very common in most portions of Ontario during the month of July. It flies at night with a rapid and noisy flight, entering the open windows of lighted rooms during the evenings, often to the great alarm of nervous inmates. This beetle measures an inch and a quarter, or even more in length, and is about one-third of an inch in width. Its body is long and narrow and of a light brown color, which assumes a darker shade on the head and antennae. The thorax is furnished with three sharp teeth on each side, and each wing case has three slightly raised ribs or lines.

Fig. 4.

The larva of this insect inhabits decaying pine wood, especially pine stumps, and is supposeed to be several years in completing its growth; it closely resembles the larva of its near relative, *Prionus laticollis*, shown in fig. 5 (after Riley.) This latter, however, differs somewhat in its habits and appetite,

Fig. 5.

seeming to prefer boring into and feeding on living roots, such as those of the Lombardy Poplar, Balm of Gilead, Apple, Pear, and especially roots of the Grape-vine, in the latter case frequently causing the sudden death of the vines attacked.

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 12),

LAVERNA.

I have only examined the neuration of one of the species which I here place in this genus, but they are all evidently congeneric, and the neuration of *L. lyonetiella* while not that of *L. cephalonthiella*, nor of either of the three species figured in *Ins. Brit., v. 3.*, does not differ therefrom more than they differ from each other. The limits of the genus are perhaps not so clearly defined as might be wished in respect to the neuration and the raised tufts on the primaries, but as the genus is at present recognized, the proper location of these species is in it. The neuration of *L. cephalonthiella* is almost identical with that of *L. Staintoni*, the chief difference being that the cell of the hind wings is closed and the superior branch of the fork of the apical vein goes to the costal instead of the dorsal margin. The neuration of the primaries is identical with that of *Staintoni*, except that the submedian is furcate at both ends. In *L. lyonetiella* the neuration of the primaries is exactly that of *Staintoni*, but the secondaries are narrower, the costal vein is very long, attaining the margin beyond the end of the cell, which is closed ; the subcostal is obsolete from the base to the end of the cell, beyond which it is distinct and furcate, one branch going to the apex and the other to the dorsal margin ; the median divides into three equidistant branches ; the submedian and internal veins are distinct, thus resembling the neuration of Chauliodus perhaps as nearly as that of Laverna. It is, however, I think nearer that of *L. longiella.*

L. œnotheræella. N. sp.

Second joint of the palpi silvery white, with a dark brown spot beneath near the tip ; third joint silvery white, with the apex and a spot beneath at the base brown. Antennae pale yellowish : face, vertex, thorax and forewings silvery white, except as follows : there is a spot at the middle of the anterior margin of the thorax, one also at its tip, and four small ones forming a transverse row across the middle, all of which are shining dark brown ; there is also a similar spot at the base of the hind margin of the forewings, which to the naked eye appears to be on the margin of the thorax before the tip ; and there is another just within the dorsal margin

of the wing, just before the middle, and a small costal one a little further back. There is an irregular golden spot, sprinkled with brownish and containing a small tuft of raised scales, on the dorsal margin just before the ciliae, which sends backwards two narrow, oblique, golden streaks, one of which passes to the dorsal margin, and the other, which has some brown scales intermixed, passes back towards the middle of the apical part of the wing, where it becomes confluent with a median, short, straight golden or orange streak, and with a rather long, curved, oblique and narrow costal streak, which begins just before the ciliae and is of the same hue with the other streaks, except near the costa, where it is brown. These three streaks proceed no further after their union, stopping short of the apex; but behind them, in the middle of the apical part of the wing and extending along through the apex and apical ciliae, is another large dark brown streak; and on the costal margin are two large, oblique, reddish golden streaks, the first of which touches the three confluent streaks above mentioned and the dark brown streak in the apex; the second one appears to be faintly divided on the costa by a small white streak, and is narrowly margined behind by dark brown scales; and behind it is a triangular white spot in the ciliae. Beyond this white spot in the ciliae are two narrow, dark brown, oblique lines, diverging from a common point and reminding one of the 'hook' in some species of Gracilaria, and the similar appearance in Polyhymno, to which, in the ornamentation of the apical parts of the wings, this species bears considerable resemblance, as it also does to some species of Lyonetia in so far as the arrangement of these marks is concerned. The apical black streak is bordered behind by a short perpendicular streak of the same hue. Dorsal ciliae white, dusted with dark brown. First two pair of legs dark brown; the tarsi of the posterior pair are annulate with yellow, the legs otherwise silvery white, marked with black spots. Abdomen pale stramineous; secondaries pale yellowish fuscous; under side of primaries fuscous. *Al. ex.* nearly half an inch.

I have also received specimens of it from Miss Murtfeldt, of St. Louis, who bred it from a larva mining in the stalk of the so-called Primrose (*Œnothera Missouriensis*), and who sends me the following notes:

"The larva of this exquisite little moth may be found during the months of August and September boring the stems of *Œnothera Missouriensis*. It feeds upon the pith, leaving the tunnel in its wake filled with coarse powdery granules, and it does not seem to check the growth of the plant to any great extent.

"The larva is cylindrical in form, with the full complement of very short legs. When mature it measures from 0.45 to 0.50 inch in length, with a diameter of 0.08. Color, pale yellow immaculate, except for the transversely oblong brown spot on the first segment, which represents the cervical shield. The incisions are deep and abrupt, and under the lens the surface appears covered with shallow punctures or stippling. On the dorsum of each segment are two transverse ridges of minute warty elevations, each giving rise to a fine light hair. Head small, oblique, polished, dark, mottled with brown ; jaws a few shades paler.

"These larvae remain dormant in the stems over winter and until spring is quite advanced. They then cut holes through the sides of the stem to, but not through, the thin outer bark or cuticle, showing on the latter like a round transparent spot. The place of egress thus provided, the larvae return to the central burrow and enclose themselves in thick, tough cocoons of white silk in the midst of a loose web of the same material The pupa is rather thick and of a pinkish color, and the wing cases cover only the upper half of the abdomen. This state lasts from 20 to 25 days, the imagines appearing about the last of May."

I have before stated that Miss Murtfeldt has sent me *Gelechia superbella* from St. Louis. St. Louis is on the same parallel that we are on at Covington, but southern insects seem to extend further north along the shores of the Mississippi than along the Ohio. This seems to be especially true as to Southern Illinois. Neither of the two species *(œnotheræella* and *superbella)* are found in Northern Kentucky.

L. unicristatella. N. sp.

Palpi slender, white, with a narrow, obscure brownish annulation about the middle of the third joint and another near the apex. Head and antennae white. Base of the wings white, except on the costa, the white extending along the dorsal margin to a tuft of raised scales about the middle, but interrupted about the basal fourth by a projection to the dorsal margin of the ochreous and fuscous scales which cover the costal portion of the wing, extending to the fold. The scales of the tuft are white, tipped with dark brown, and immediately before it the white of the dorsal margin projects across the fold into the ochreous and fuscous portion of the wing. In the ochreous and fuscous portion those colors are intermixed with each other and with some white scales, and they spread over the apical part of the wing, where the white is increased in

quantity so as to form an indistinct, pale, irregular fascia at the beginning of the ciliae; at the apex the ochreous brown again prevails over the white. At the base of the costa the ochreous fuscous is very narrow. Posterior wings purplish fuscous; under surface and legs whitish, the legs marked with brownish on their anterior surfaces. *Al. ex.* $\frac{7}{16}$ inch.

L. rufocristatella. N. sp.

White; antennæ annulate with brown. There is a small reddish ochreous tuft on the disc before the middle of the primaries, behind which the wing is suffused with reddish ochreous; a larger tuft nearly opposite to the first one, and nearer to the dorsal margin, of the same hue with the first one, and another just within the dorsal margin opposite the beginning of the ciliae. Between this last tuft and the costa, and thence to the apex, the wing is suffused with reddish ochreous, sparingly dusted with fuscous. *Al. ex.* $\frac{7}{16}$ inch. Season, July.

L. ignotilisella. N. sp.

No raised tufts on the wings. Silvery white, the costal margin about the middle dusted with pale purple and ochreous scales: an irregular streak or sinus of spots, which are connected by ochreous brown dusting, begins before the middle of the disc, and extends backwards, spreading over the apical part of the wing. *Al. ex.* $\frac{6}{16}$ inch. Season, September.

L. albocapitella. N. sp.

Head, thorax and base of the dorsal margin of the wings pure snowy white; antennæ purplish fuscous, iridescent; palpi white, stained externally wtth pale purplish fuscous; the white patch at the base of the dorsal margin of the primaries is posteriorly narrowly margined with dark brown, containing a small raised tuft on the margin. The remainder of the primaries are of an indescribable hue, composed of grayish brown ochreous and white scales intermixed, the former hue predominating, or rather, it is brown streaked with ochreous and sprinkled with white; there are three small tufts of dark brown raised scales, each anteriorly margined with white, the white followed by a margin of dark brown; two of them are on the disc before the middle, the other further back and nearer the dorsal margin, and behind it is a fourth tuft also near the dorsal margin; there is a short dark brown streak in the apical part of the wing, within the dorsal margin, and a small dark brown spot about the end of the disc. *Al. ex.* $\frac{7}{16}$ inch. Season, September.

L. parvicristatella. N. sp.

White, suffused with purplish brown; the second joint of the palpi suffused with purplish brown, and a brown annulus about the middle; antennae annulate with pale brown; primaries suffused with purplish brown, with an oblique brown streak beginning on the costa near the base, and extending nearly across the wing; another about the middle, crossing the wing, and a third less oblique and shorter about the beginning of the costal ciliae, and produced backwards along the middle of the apical part of the wing, interrupting an indistinct, angulated white fascia; these streaks are not continuous, but are rather composed of small purplish brown spots of slightly raised? scales, with a more distinct raised tuft near the dorsal margin in each of the first two streaks, and between the small spots the wing is more deeply suffused than elsewhere. Dorsal ciliae silvery, those of the apex suffused with purplish; there is a narrow streak of dark brown scales along the middle of the apex. *Al. ex.* $\frac{7}{16}$ inch.

L. miscecalonella. N. sp.

White, suffused with ochreous yellow, with a raised tuft of the same hue in the middle of the disc on the primaries; basal third of the primaries (except the base of the dorsal margin) brown, with reddish ochreous scales intermixed, and containing two tufts of dark brown raised scales, one of which is close to the dorsal margin, and before it to the base the margin is of the general hue (white, suffused with reddish ochreous), dusted a little with reddish fuscous; opposite to the dorsal tuft, just within the costal margin, is another larger raised tuft; the middle part of the wing is yellowish white, and behind it the wing is deeply suffused with reddish ochreous, containing about its middle a tuft of dark brown scales; apical part of the wing suffused with reddish ochreous and fuscous; second joint of the palpi pale ochreous yellow, externally fuscous, and the third joint is dark fuscous, except at the base and extreme tip. *Al. ex.* ½ inch. Season, May.

L. fuscocristatella. N. sp.

White; second joint of the palpi with two pale fuscous annulations; antennae white, annulate with fuscous; head and upper surface of the thorax white; there is a small dark brown spot on each side of the thorax, over the base of the wings; primaries white, with two small dark brown spots on the extreme costa at the base, two other larger ones just

within the costa behind them, one behind the other, and a small spot opposite the space between them, beneath the fold; the portion of the wing from the basal fourth to the end of the disc, included between the costa and the fold, is suffused with bluish fuscous scales, each of which under the microscope appears tipped with hoary, and the extreme costa is black; the wing beneath the fold is whitish; just before the middle is a lunate streak of dark brown raised scales, extending from the dorsal margin to the fold, and margined with white in the concavity behind; at the end of the disc are two other larger tufts of bluish brown raised scales, margined before by yellow ochreous, and opposite to them is a long, narrow, very oblique white costal streak, margined behind by a narrow, dark brown line, which separates it from a somewhat wider yellow ochreous streak, containing three small white costal streaks or spots; behind the tufts the wing is ochreous, streaked with fuscous. *Al. ex.* ½ inch. Season, June.

RECENT NOTES ON THE PHYLLOXERA FROM FOREIGN SOURCES.

[FROM "ENTOMOLOGICAL RECORD," BY TOWNEND GLOVER, IN MONTHLY REPORT OF THE U. S. DEPARTMENT OF AGRICULTURE.]

In November last, information was received from Henry Erni, United States consul at Basle, Switzerland, that the *Phylloxera vastatrix* had made its appearance near Geneva, and in December the following letter was received, which is published in full:

Referring you to my dispatch No. 95, about the appearance of the grape-root louse at Pregney, near Geneva, the riddle received lately an important solution, for the insect was discovered in the grape-houses of the Baron Rothschild, at his villa near Geneva. It is proved that some of these grape-vines were imported from England, in 1869, where the disease ocurred in grape-houses as early as 1863. From these facts the origin of the grape-louse at Pregney appears obvious.

At the meeting of the French Academy, on the 19th of October last, Professor Dumas stated that two substances had now been discovered

capable of destroying the Phylloxera: 1st, the sulpho-carbonate of potassa, and 2d, coal-tar. Neither of these would injure the grape-plant. Experiments made on a large scale at Cognac and Montpelier, France, by delegates of the academy, were highly efficient. Both ingredients are cheap, for the price of a kilogram of each does not exceed one franc. The sulpho-carbonate of potassa is dissolved in water up to 37° Baumé, and 80 cubic centimeter ($\frac{8}{100}$ liter) poured upon every diseased grape-root. The best time is in November and March, the ground at that time being moist and the insect sure to be in winter quarters. The expense per vine amounts to about 10 centimes. Applying coal-tar, each root receives about 2 kilograms of this liquid, when it will penetrate the ground about 2 feet deep. In both cases the grape-louse is effectually killed. I am, sir, &c.,

H. Erni, United States Consul.

We also give extracts from the report of the international congress of vineyardists, at Montpelier, France, October 28, 1874, on the same subject, from the Journal d'Agriculture Pratique, No. 46:

The floor was taken by Mr. H. Marès, permanent secretary of the agricultural society of Herault, and president of the ministerial commission. He commenced by recalling to mind the experiments of 1872 and 1873, with the Phylloxera, which were unsatisfactory on account of the invasion of the "pyrale." In 1872 a new experimental field was selected, near Montpelier, belonging to M. Michel Termand. The experiments commenced the 6th July, and comprise fifty-one methods, applied to squares of 25 vines each, the squares being separated by two rows of untreated vines, left to serve as means of comparison, and to prevent confusion in the effects of various modes of treatment. One hundred and forty methods have since been tried in the same vineyard, of which thirty-three were beneficial and nine injurious; the others appeared to have no effect. The most beneficial were as follows, the soil being chalky and ferruginous: Potassium sulphate disolved in urine; a mixture of the sulphurized manure of Berre, colza cake, and ferric sulphate; potassium sulphate dissolved in water; potash soap dissolved in water; soot; a mixture of farm-dung, wood-ashes, and ammonium hydrochlorate; cow-urine alone or with the addition of gas-tar. All the methods which have proved advantageous are also manurial, especially the salts of potash and ammonia. The injurious methods are those insecticides not manures, as carbonic sulphide, turpentine, petroleum, gas-tar, and phenic

acid not diluted. The committee came to this conclusion : that manures, especially those rich in potash and nitrogenous substances, benefitted the affected vines.

The trials were continued in 1874 on the thirty-three squares already improved, one-quarter of each being left to see if the improvement was permanent. The total number of experiments made was two hundred and fifty-nine, extending over two and one-half hectares. The squares which were benefitted in 1872 and 1873 have in some cases this year almost returned to their original vigor, but the Phylloxera has not disappeared.

As regards the fruit, the following treatment has given the best results : 1, Yard-dung, wood-ashes, and sal ammoniac. 2, Yard-dung, wood-ashes and fat lime. 3, Cow-urine and fish oil. 4, Cow-urine alone. 5, Oil-cake. 6, Potassium sulphate and urine. 7, Cow-urine and gas-tar. 8, Soot. 9, Sulphur, salt of Berre, ferric sulphate and colza cake. The vines surrounding the squares treated were also visibly affected.

The experience of 1874 confirms and completes the results of 1872 and 1873, showing a diseased vine may at least temporarily be restored to vigor by energetic treatment. The commission considers itself justified in asserting that manures, rich in potash and nitrogen, mixed with alkaline or earthy sulphates, refuse of salt-works, soot, wood-ashes, ammonia, or fat lime, have increased the productiveness of the vines and allowed the fruit to ripen.

According to M. Marès the vine-disease is the result of combined causes, and subject to several conditions, viz.: 1. The nature of the soil, as it effects the vine and the insect, frequently a determining condition. 2. The influence of climate on the vine, and also whether or not it favors the extension of the insect. 3. The strength or vigor of growth of the vine itself, which varies according to the variety and mode of culture. The wild vine does not perish ; the stock nearest approaching it is hardly attacked.

M. Laliman spoke next, affirming that rooted American cuttings had been cultivated in localities where the Phylloxera had as yet failed to appear, either on the American or native stocks.

M. Planchon then discussed the American vines, dividing them into three principal groups : 1. The Labrusca ; berries with foxy taste. 2. Œstivalis ; berries small ; leaves deeply indented ; wooly on the veins. 3. Cordifolia, of which the Clinton is a variety ; leaves smooth, berries

small. The Scuppernong, derived from the Cordifolia, attains a prodigious developement, one stock covering one-third of a hectare, but it is too wild. All these resist the Phylloxera better than our varieties, perhaps because they have not been so long in a state of cultivation. The insect does not extend its ravages beyond the small roots of the American varieties. But while the American vines do extremely well in France, they should not be imported where Phylloxera is unknown, for fear of introducing it, as the speaker is decided in asserting that it originated in America.

M. Max Cornu gave a summary of his experiments. He confined himself to substances giving off poisonous vapors, among which sulphocarbonates gave the best results.

M. Bouchet de Bernard, in a communication, advocated grafting French vines on American stocks, thus obtaining good vines and roots capable of resisting the attacks of the Phylloxera. M. Leissoniere supported these ideas, asserting the positive inferiority of the American vines. M. Terrel de Chênes stated that during five or six weeks the Phylloxera left its subterranean abode and crawled up the stock, hiding under the bark six inches above the ground. M. Douysset told how well the American vines grew at Roquemaure. And the session terminated with a communication from M. Petit, of Nimes, who lauded the value of coal-tar against the Phylloxera.

At 8 o'clock, 29th October, the members assembled at Comedy Square, to visit the field of Las Sorres, and view with their own eyes the results spoken of by M. Marès. The experimental field should give some consolation to our brethren of the South, for the squares of green vines in the middle of general desolation show that the genius of man may triumph over the Phylloxera, as it already has over the Oidium.

The cellar of Saporta, belonging to M. Vialla, was visited, and the excursion terminated at the vineyard of M. Gaston Bazille, near Lattes. His yards join others not yet treated for the Phylloxera, and we can hardly describe the extraordinary difference in the vines. Here they are digging up the stocks to throw away ; there they are covered with leaves and vigorous branches. A part were treated with cow-urine and calcium sulphate, a part with urine alone. In another place, submersion has been tried with success, and new ditches are now being dug.

In the session of October 30, M. Lichtenstein continued an essay by M. Roessler, delegate of the Austrian government. In his country the

grape-growers believe the Phylloxera came from America. They are opposed to destroying the vines, and believe in studying the insect and fighting it with manure and phosphates, ammonia, and potash. This treatment succeeds in porous soils, and to obtain this porosity the learned delegate had made use of dynamite, raising the ground thus from a great depth without injuring the vines. He then puts some chalk and phosphorus at the foot of the stock and irrigates. A gas is disengaged by the humidity, which destroys great quantities of insects, and by this means he obtains a crop. M. Lichtenstein added to this communication the result of his personal observations, that from the 15th August to the 15th September the Phylloxera takes wing and departs. He was not able to distinguish the sexes, but there was a time when the insect laid an egg which gave birth to the mother of the legions which devastate the vineyards. At this time the insect is within reach, and should be destroyed. In studying the Phylloxera of the vine the speaker discovered the Phylloxera of the oak.

Viscount de Saint Trivier, delegate from the Rhone, gave a history of the progress of the Phylloxera in his neighborhood, where it appeared three years ago. He pulled up some vines in April and June, but found no Phylloxera; but in July they appeared, which fact made him think, with M. Cornu, that the temperature must be at least 15° cent. He obtained good results by covering the stocks with a sort of paste made of saw-dust and coal-tar. M. Denis employed boiling water, to which he added one-tenth of tobacco-waste.

M. Loubet did not believe in medicines, but advocated patient replanting till the disease disappeared of itself, as he believed it soon would.

CORRESPONDENCE.

INTERESTING CAPTURES.

Last summer, while camping out with a party of friends on some of the small lakes north of Lake Ontario, ostensibly for the purpose of fishing, I kept on the alert for entomological rarities, and was rewarded by the discovery of two specimens of a *Grapta*, which I immediately recognized as *G. satyrus* Edw., though much astonished at the occurrence of the species so far from its usual habitat—the Pacific coast and Sierras of California—and hitherto not found at all on this side of the Rocky Mountains. Yet they were unmistakeably *satyrus*, and Mr. Edwards, on receiving one of the specimens, corroborated my opinion in the matter.

With a somewhat quickened pulse I cautiously approached the first specimen noticed, and successfully netted it; the other was secured with more difficulty, being very wild and frequently flying far into the woods, and then after a few moments returning to the patch of milkweeds where first found.

The two specimens were taken on the 22nd of July, on the shores of Cameron Lake, in Victoria County, Ont., and were the only ones seen during a stay of over a month in the neighbourhood. They were found in company with many *G. progne* and *comma* of both varieties (*dryas* and *Harrisii.*) *Argynnis cybele* and *aphrodite* were found in considerable and about equal numbers, and several specimens of *Thecla strigosa* were taken at the same place. *G. satyrus* is readily distinguished from *comma* by the honey-yellow under surface and great distinctness of the tawny fulvous marking above, that of the hind wings never being obscured by shades of deeper brown. Several specimens of *Arctia (Euprepia) Americana* were taken at our camp fires at various times during our stay; it was necessary to wait, net in hand, and pounce upon them before they were able to reach the fire, as their motions were quite rapid. The first specimen obtained was fished out from the frying-pan while culinary operations were going on—of course ruined—but others were secured in good condition by holding lighted birch-bark torches out a little distance from the shore; the moths flew down into the water and were readily captured. Several hundred eggs were laid by females pinned in the collecting box, and quite a number of the larvæ lived till winter and are now hybernating; they showed no preference as to food, but like most Arctians, devoured almost any green thing within their reach. If they survive the winter I will hereafter give an account of their transformations.

THEODORE L. MEAD, Ithaca, N. Y.

Mr. Knetzing, of this city, has discovered a locality for *B. infans.* They are found in a clump of White Birch, north of the village of Hochelaga. I believe this is the first record of its occurrence in this Province. *B. infans* is closely allied to *B. parthenais* of Europe, the caterpillars of which also feed on White Birch.

Mr. Pearson, one of our members, was fortunate in procuring a fine specimen of *Samia Columbia* from a cocoon found by him at Hochelaga.

Biston ursarius was as prolific as ever last season on the Lombardy Poplar, while the trees were as leafless as in mid-winter.

WM. COUPER, 67 Bonaventure St., Montreal, P. Q.

The Canadian Entomologist.

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ON SOME OF OUR COMMON INSECTS.

THE BEAUTIFUL WOOD NYMPH—Eudryas grata.

BY THE EDITOR.

This moth (see fig. 6) is truly a beautiful creature. Its fore wings are creamy white with a glossy surface, with a wide brownish purple stripe along the anterior edge, reaching from the base to a little beyond the middle of the wing. On the outer margin is a broad band of the same hue, widening posteriorly, with a wavy white line running through it, composed of minute pearly dots or scales. It is bordered internally with dull deep green. The brownish purple band is continued along the hinder edge, but it is much narrower here and terminates a little before it reaches the base. There are also two brown spots, one round, the other reniform, near the middle of the wing, often so suffused with pearly white scales as to be indistinct above, but clear and striking on the under side.

Fig. 6.

Colors, creamy white and brownish purple

The hind wings are reddish yellow, with a broad brownish purple band along the outer margin, extending nearly to the outer angle, and powdered here and there with a few whitish pearly scales; there is also a faint dot on the middle of the wing which is reproduced more prominently on the under side. The under surface of both wings is reddish yellow. The head is black, and there is a wide black stripe down the back, merging into a series of spots of the same, which extend nearly the whole remaining length of body. The sides of the body are reddish yellow with a row of blackish dots close to the under surface. The fore legs are beautifully tufted with white, the shoulder covers also are white, and so is the under surface of the body.

When this moth is at rest—that is, during the day time—its wings are closed like a roof over its back, and its tufted fore legs are stretched out.

The insect passes the winter in the chrysalis state, emerging as a moth from the middle of June to the middle of July. The earliest recorded date we have of the appearance of the moth is June 25th. It is usually common during the last week in June and the first in July, when it may often be found in the day time fast asleep on the leaves of the grape vine.

Soon after the moths appear they begin to deposit their eggs. These are among the prettiest and most beautiful of insect eggs; at *e*, fig. 7 (after Riley) we have a view of the upper surface, and at *f* a side view of this charming object. It is round and very flat; its color is yellowish or greenish yellow, with an enclosed ring of black placed a little beyond the middle, and sometimes nearer to the outer margin. In the centre of the egg is a large, nearly round dot, and at a little distance from this a circle of smaller dots, from which arise a series of from 24 to 27 raised striae, diverging equally as they approach the outer edge, and crossed by many gracefully curving lines which interlace also the spaces between.

Fig. 7.

When mature, the young caterpillar escapes from the upper part of the egg, lifting the centre and rupturing the portion placed over the black ring. In some cases we have observed the egg shell to be eaten by the newly hatched larva; in others it remains almost untouched. The young larvae have a strange habit of twisting their hinder segments and throwing them forward, resting on the anterior segments in a curious manner. At this age they eat small holes all over the vine leaves in different parts; they are often solitary, but sometimes two or three may be found on a single leaf.

When mature, the full grown larva appears as at *a*, fig. 7; it is then nearly one and a half inches long, tapering towards the head, thickening towards the posterior extremity. The head is of an orange color, with a few round black dots and pale brownish hairs.

The body above is pale bluish, crossed by bands of orange and many lines of black. Each segment, excepting the terminal one, is crossed by an orange band, all of which are nearly uniform in width, excepting that

on the 12th segment, which is much wider. These are all more or less dotted with round black dots, from each one of which arises a single short brown hair. There are also crossing each segment six black lines, placed nearly at equal distances along each side, but with a wider space in the middle, where the orange band occurs. The twelfth segment is much raised, and the terminal one suddenly sloped. The under side is very like the upper, and also marked with orange and black; feet and prolegs orange, spotted with black.

The larvae feed on Virginia Creeper *(Ampelopsis quinquefolia)* as well as on the Grape-vine, and Mr. Bowles, of Montreal, has found them feeding on the Hop.

When full grown, they descend to seek some secure retreat in which to pass the chrysalis, or inactive stage of their existence. They are fond of boring into old pieces of wood, and in the chambers thus formed they find secure lodgment; they will also bore into corn-cobs. When rearing them we have supplied pieces of cork for this purpose, and have had as many as twenty-one chrysalids enclosed within two small bungs about 1½ inches in diameter, and one inch thick. The excavation is but little larger than the chrysalis which is to rest in it; it is not lined with silk, but is made moderately smooth and is furnished with a cap or cover composed of minute fragments of cork, formed into a sort of membrane by means of a glutinous secretion mixed with threads of silk. When nicely finished the surface of this cover is slightly glossy, the glossiness extending a little beyond the actual orifice, indicating that the glutinous matter has been of a thin consistence and has spread a little during its application. When the lid is lifted the head of the chrysalis is usually found quite close to it.

Fig. 8.

The chrysalis is about seven-tenths of an inch long, of a nearly uniform dark brown color, and roughened with small blackish points or granulations.

This insect is subject to the attacks of a parasite, a two-winged fly—a Tachina—probably the species known as the red-tailed Tachina fly, *Exorista leucania*, see fig. 8 (after Riley.) It is not much unlike the common house fly in appearance, is about a quarter of an inch long, with a white face, large reddish eyes, a dark hairy body with four, more or less distinct dark lines down the thorax, and patches of a greyish shade along the sides of the abdomen. The parent fly deposits

her eggs on the back of the caterpillar, usually a short distance behind the head, where they are cemented firmly by means of a peculiar secretion with which the insect is furnished. Three or four of these eggs are usually placed upon a single caterpillar, where, after a few days, they hatch, when the tiny worms eat their way through the skin into the interior of the body, where they feed upon the fatty matters, instinctively avoiding the vital organs. When the caterpillar is about full grown it dies, and from its body emerge these three or four full grown whitish grubs, which soon after their exit change to chrysalids. These are nearly one-fifth of an inch long, oval, smooth and of a dark brown color, from which in due time the perfect flies escape.

PRELIMINARY LIST OF THE NOCTUIDÆ OF CALIFORNIA.

Part IV.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

61. Prodenia præfica Grote.

Allied to the Eastern *lineatella;* a little larger, with broader wings. The hind wings are more obscure, in the female subfuscous. The markings are so nearly alike in the two that I do not find good differences. Nevertheless, the tone of the three Californian specimens is less bright, the whitish apical shade is less defined, and the discal point beneath on the secondaries is evident and distinct, whereas it is wanting in *lineatella.* The extra basal and subterminal fields show a purply shading in *præfica. Expanse* 36 m. m.

California, No. 5568, Mr. Hy. Edwards; Mendocino, June, Mr. Behrens.

62. Himella furfurata Grote, Proc. Acad. N. S., Phil., 1874, p. 204.

Sauzalito, Mr. Behrens, Oct., Nos. 182 and 223.

The Californian specimens are a little darker than my type, more distinctly marked, the palpi distinctly blackish outwardly.

63. Pyrophila pyramidoides (Guen).

A specimen sent by Mr. Behrens does not differ from Eastern material.

64. Graphiphora pacifica (Harvey), Bul. Buff. S. N. S., 2, 120.

Sauzalito, February, Mr. Behrens, No. 27 (red label).

The specimens seem merely to differ from the European *incerta* and the Eastern *alia* in tone. It is possible that all three names refer to a single species.

65. Graphiphora arthrolita Harvey, Bul. Buff. S. N. S., 2, 275.

California, Nov., No. 208, Mr. Behrens.

66. Zotheca tranquilla Grote, Bul. Buff. S. N. S., 2, 69.

California, Mr. Hy. Edwards, No. 160.

67. Orthosia purpurea Grote, Bul. Buff. S. N. S., 2, 125.

Sauzalito, Oct., Nov., No. 3 (red label), Mr. Behrens.

68. Orthosia crispa Harvey.

Sauzalito, Oct., Nov., No. 5 (red label), Mr. Behrens.

69. Pseudorthosia variabilis Grote, Bul. Buff. S. N. S., 2, 161.

Sauzalito, Mr. Behrens, Nos. 166—168, 223, September to October. Very variable in color. Specimens range from a pale fawn with nearly immaculate primaries, through reddish brown to dark olive brown with distinct markings.

70. Glaea olirata Harvey, Bul. Buf. S. N. S., 2, 120.

California, Mr. Behrens, No. 9 (red label), September.

71. Xylomiges patalis Grote, Bul. Buf. S. N. S., 1, 144, pl. 4, fig. 11.

Mendocino, Mr. Behrens. No. 18 (red label); Vancouver Island, Mr. Hy. Edwards, No. 5586.

72. Xylomiges hiemalis Grote, Bul. Buff. S. N. S., 2, 71.

Oakland, January, Mr. Behrens, No. 18 (red label).

73. Xylomiges curialis Grote, Bul. Buff. S. N. S., 1, 143.

California, Mr. Behrens, No. 8.

74. Xylomiges crucialis Harvey, Bul. Buff. S. N. S., 2, 277.
California, No. 5575, Mr. Hy. Edwards.

75. Cucullia serraticornis Lintner, 26, Am. Rep. N. Y. State Cab., 174.
Cucullia matricariæ Strecker.
California, Mr. Behrens, No. 5.

76. Adipsophanes miscellus Grote, Bul. Buff. S. N. S., 1, 181.
Californian specimens are labelled May 8th, by Mr. Behrens.

77. Ablepharon absidum Harvey, Bul. Buff. S. N. S., 2, 275.
Oregon, No. 2734, Mr. Hy. Edwards.

78. Plusia Pasiphæia Grote, Bul. Buff. S. N. S., 1, 146, pl. 4, fig. 1.
California, Mr. Hy. Edwards, No. 152.

79. Plusia bractea (S. V.), Bul. Buff. S. N. S., 2, 72.
Mr. Behrens, Mendocino, June.

80. Plusia gamma (Linn.) Can. Ent., 6, 16.
California Mr. Hy. Edwards, 147; Vancouver Island, No. 4386.

81. Plusia labrosa Grote, Proc. Acad. N. Sci., Phil., 1874, 207.
Sauzalito, Mr. Behrens, August, No. 162.

82. Plusia Hochenwarthi (Hochenw).
California, Mr. Behrens.

83. Acerra normalis Grote, Bul. Buff. S. N. S., 2, 162.
California, Mr. Behrens, No. 61.

84. Heliolonche modicella Grote, Bul. Buff. S. N. S., 1, 116, pl. 3, fig. 12.
California, Mr. Hy. Edwards, No. 104.

85. Heliosea pictipennis Grote, Bul. Buff. S. N. S., 2, 220.
California (Mr. Crotch, Mus. Comp. Zool. Cam).

86. Adonisea pulchripennis (Grote), Proc. Bost. Soc. N. Hist., 16, 241.
California, Mr. Hy. Edwards, No. 4380.
California (Mr. Crotch, Mus. Comp. Zool. Cam.)

87. Melicleptria diminutiva Grote, Bul. Buff. S. N. S., 1, 148.
California, Oregon, Mr. Hy. Edwards, No. 204.

88. Melicleptria Californiensis Grote, Bul. Buff. S. N. S., 2, 34.
Mr. Hy. Edwards, No. 93.

89. Melicleptria prorupta Grote, Trans. Am. Ent. Soc., 4, 294.
California, Lord Walsingham (in Am. Ent. Soc.); Mr. Crotch (in Mus. Comp. Zool. Cam).

90. Heliothis phlogophagus G. & R.
California, Mr. Hy. Edwards, No. 151; Mr. Behrens.

91. Heliothis armiger (Hübn).
California, Mr. Hy. Edwards, No. 2566; Mr. Behrens, No. 54.

92. Axenus arvalis Grote, Bul. Buff. S. N. S., 1, 152, pl. 4, fig. 8.
California, No. 106; Oregon, No. 5254, Mr. Hy. Edwards.

93. Annaphila diva Grote, Bul. Buff. S. N. S., 1, 150, pl. 4, fig. 14.
California, No. 198, Mr. Hy. Edwards.

94. Annaphila depicta Grote, Bul. Buff. S. N. S., 1, 150, pl. 4, fig. 13.
California, Mr. Hy. Edwards, No. 2260.

95. Annaphila decia Grote.

Under the number 2587, Mr. Hy. Edwards sends two specimens of a smaller species than *depicta*, differing by the want of pale and brown shades on the reniform and along the t. p. line on the fore wings. The bright yellow secondaries have the black margin much wider and distinctly limited, intruded upon centrally by the yellow ground color. Beneath the fore wings have the terminal margin black as on the hind wings, not with the subterminal black fascia of *depicta*. Otherwise in markings and appearance the two species are very similar. *Expanse* 18 m. m.

96 Annaphila mera Harvey, Bul. Buff. S. N. S., 2, 277.
California, Mr. Crotch.

97. Tarache flavipennis Grote, Bul. Buff. S. N. S., 1, 153.

Sierra Nevada, Oregon, No. 2590, Mr. Hy. Edwards. The specimens are all females, and vary in the depth of color and extent of the yellow

central shading on the secondaries. Also that in one specimen the hind wings show a distinct median fascia beneath, usually indicated by a costal mark. In the pale yellow specimen this lighter shade replaces the deep yellow of the hind wings beneath. The t. p. line is marked by bluish metallic dots.

98. Trichotarache assimilis Grote.

♂. The eyes are constricted, naked. The antennæ naked. The body squamation is rough and hairy. The fore wings are narrow at base, with depressed costa, and widen terminally. In ornamentation the moth resembles *Tarache flavipennis*. The fore wings are olive blackish with gray or smoky whitish fringes, terminal space and median costal blotch which exhibits the black discal point as in *T. flavipennis*. The pale color also intrudes on costa before the s. t. line. The ordinary lines are fragmentary, marked by velvety points. Hind wings fuscous, yellow stained on the disc, with pale interlined fringes. Beneath yellow with blackish hind and external margins to the hind wings and costal stain, while on the fore wings there is a subterminal fuscous fascia, discal mark and costal stain above it; the fringes are pale. Body fuscous and mixed with pale hair. At first this insect looks like the possible male of *T. flavipennis*, but it differs apparently generically by the shaggy vestiture and narrow eyes. It differs in ornamentation by the terminal space being distinctly pale and by the want of metallic points on the t. p. line. *Expanse* 26 m. m.

California, Mr. Hy. Edwards, No. 2589.

99. Galgula hepara Guenée.

California, No. 2575, Mr. Hy. Edwards. The specimen does not seem to differ from my material from Alabama.

100. Galgula subpartita Guenée.

Sauzalito, Nov. 11th, No. 211, Mr. Behrens. The specimen is paler and more distinctly marked than Eastern specimens, but seems to belong to the same species.

101. Drasteria erechtea (Cramer.)

California, No. 1, Mr. Behrens. The specimens of this variable species agree with the typical form of the East, but are larger.

102. Drasteria cærulea Grote, Bul. Buff. S. N. S., 1, 155.

California, Mr. Behrens, No. 2; Mr. Hy. Edwards, 91. Two specimens, No. 699, are sent by Mr. Hy. Edwards, labelled "Sierra Nevada." They seem merely to differ by the absence of the parallel fascia-like dark shades to the median lines.

Litosea.

This name is proposed for the Eastern *convalescens* and a new Californian species, both differing from *Drasteria* by the male antennae being bipectinate.

103. Litosea adversa Grote.

A unicoloroous grayish species, with the thread like lines extremely inconspicuous. A black dot in the place of the orbicular. The t. p. line marked by a pale shade, nearly straight and adjacent to the similarly marked subterminal line, with which it is sub-parallel. Hind wings pale, yellowish gray, with double even lines like *convalescens*, not uneven as in the species of *Drasteria*. Beneath pale yellowish-gray, powdered with ochreous, usually deeper stained outwardly. Faint discal dots and indications of double outer transverse common lines. More gray than *convalescens*, and distinguishable by the pale straight outer shaded lines of the fore wings. *Expanse* 36 m. m.

California, No. 6, Mr. Behrens (green label); Mr. Hy. Edwards, No. 708.

104. Euclidea cuspidea (Hübn.)

California, Mr. Mead, No. 38; Mr. Behrens, No. 4 (green label).

NOTES ON THE LARVA OF GRAPTA FAUNUS Edwards.

BY F. B. CAULFIELD, MONTREAL, P. Q.

On the 6th of June, 1874, I found on a wild gooseberry bush four larvæ of *Grapta faunus* Edwards. Length of full grown larva, 1¼ inch; form cylindrical; head flat in front, black, furnished with two branching horns and a few scattered white hairs; a yellow V-shaped stripe in front; the base between the horns, the ends pointing towards the mandibles; mandibles black.

Upper surface, second to sixth segments brick red, striped transversely with blue, yellow and black lines ; a few white hairs on second segment ; four branching yellow spines with black tips on third and fourth segments ; six on fifth and sixth ; seventh to twelfth segments white, with a faintly marked black dorsal strip ; each segment with three transverse yellow bands and two oblique black spots ; seven branching spines on each segment, viz., three on upper surface white, one on side brown, and one close to under surface white ; two last segments black—twelfth with seven spines, five white and two brown ; thirteenth segment with four white spines. Sides red, with two black bands, the lower band spotted with blue. Under surface grey, striped transversely with black. Feet and prolegs black.

These larvae suspended themselves to the lid of the box in which they were confined by a small button of very light pink silk, on June 18th, 1874, and in about twenty-four hours changed to grayish brown chrysalids. Head with two bi-forked horns, the outer point very short ; thorax with an elevated keel-like ridge on top, with a small tubercle on each side. At the base, below this, there is a larger tubercle, and behind it another keel-like protuberance, hollowed on top ; there are six raised silver ornaments on the dorsal surface, the first resembling in shape a capital G ; the second is an oblong spot, and the third is a sharply-pointed tubercle. The abdominal segments are furnished with eight rows of tubercles ; on each side are five brown spots, decreasing in size towards the posterior extremity, and below the spiracles there is a brown stripe. Under surface gray, with ten brown spots.

The first butterfly emerged from chrysalis on July 3rd, 1874, the second on the 4th, the third on the 6th ; the other died in chrysalis.

These larvae fed freely on wild gooseberry, but I do not think it is its favorite food, as these were the only larvae of *faunus* that I could find, although I searched closely for them. Mr. Edwards informs me that Mr. Scudder found the larva of *faunus* on Willow, and that may be its principal food plant here, for *faunus* was very plentiful here last season (1874), and if the larvae had been common on the Gooseberry I must have found them, as I examined numbers of the bushes, finding plenty of larvae of *G. progne*, but only four of *faunus*.

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 35.)

LAVERNA.

Corrigenda :

The publication of the paper on this genus in the February number of this magazine, in its present form, was unfortunate, and resulted from a misunderstanding by the Editor of a letter addressed by me to him. The paper was prepared from specimens contained in Mr. Belfrage's first collection, and was sent by me to the Editor some months ago. Further study of that collection and of additional material, induced me to suppress some of the descriptions and to amend others, and with a view thereto I requested a return of that portion of the mss. Unfortunately my letter was misunderstood. and the wrong mss was returned to me, while the paper on Laverna was published. The following corrections will, I hope, prevent any confusion which might otherwise arise.

For *L. lyonetiella*, wherever it occurs in that paper, read *L. œnotherœella*. *L. lyonetiella* was the original mss name, given from its resemblance in ornamentation to some species of Lyonetia. Afterwards, on discovering the food plant, the name was changed to *L. œnotherœella* at p. 30 *ante*, but the correction was not made throughout the paper.

For *L. ignotiliella*, p. 33, read *L. ignobilisella*. The description of this species is imperfect, and was intended to be suppressed. It is not in my power now to improve it.

For *L. fuscocristatella*, p. 34. I am satisfied from further study that this description was made from damaged specimens of the species described by me in the January number as *Naera fuscocristatella*. Naera is preoccupied among Mollusca, and I substitute for it Leuce. It is more nearly allied to Gelechia than to Laverna.

For *L. miscecalonella*, p. 34, read *miscecolorella*. The following description is at least an improvement on the former one:

Vertex and antennae brown; face and inner surface of the palpi ochreous yellow; outer surface of the palpi brown, except at the base and extreme tip, which are ochreous yellow; thorax on top and basal third of

the forewings dark brown, with some reddish ochreous intermixed, especially about the base of the hind margin, which is paler than the remainder of the basal portion of the wing; in the basal costal part of the wing are two small dark brown tufts, which, from their obscurity, are likely to escape observation; near the posterior margin of the brown basal portion are two large dark brown raised tufts, one of which is nearest the costal and the other to the dorsal margin, the *latter* being the largest. The middle third of the wing is pale ochreous, with a faint reddish tinge, and is crossed a little obliquely by three almost confluent raised tufts of the same hue, which, without very close observation, will be mistaken for a continuous transverse row of raised scales, or for two tufts, one costal, the other dorsal. In this middle portion of the wing the extreme costa is marked by numerous small dark brown spots, and the tuft is dark brown on the costal margin, and there are one or two small dark brown spots on the disc. Following this middle ochreous portion of the wing is a rather narrow and irregular band of dark brown and reddish ochreous scales, containing a large dark brown tuft on the dorsal margin, and some raised scales near the costa. Immediately behind this band is a whitish spot on the costal margin, while on the dorsal margin the brown band extends back along the margin of the dorsal ciliae to the apex, and contains a row of minute dark brown slightly raised scales, extending around the apex at the base of the ciliae, which are brownish gray. The under surface of the body is whitish, and the legs and tarsi are dark brown with white annulations. *Al. ex.* a little over half an inch.

To the naked eye the anterior and apical parts of the fore wings are brown, and the middle third stramineous.

The neuration is that of Chauliodus, except that only four, instead of five veins are given off from the cell to the hind margin, but the fifth is indistinctly indicated. The tongue is scaled (naked in Chauliodus), the second joint of the palpi is scarcely clavate and is shorter than the third, and the tufts do not project over the margins of the wings as in Chauliodus, and the somewhat elongate basal joint of the antennae has no hairs depending over the eyes as in that genus. The neuration and palpi are very nearly that of *Perimede erransella* Chamb.; perhaps they ought not to be separated generically, and, indeed, as to this species and the other Texas species in this collection, I am not sure that they should be included in Laverna, though if they are separated from it, several of the recognized European species would with equal reason be also separated from it, and more than one new genus would have to be *created*. In

truth, I am unable to determine what constitutes a true Laverna. *L. cephalanthidla* Cham. is probably nearer it than any other American species; but the species referred to this genus by European authors differ greatly in structure, more greatly, perhaps, than do those which I have referred to it. I doubt greatly whether any well marked lines separate it from Chauliodus, Chrysaelista, or even from Theisoa and Elachista.

L. obscurusella. N. sp.

The tongue is scaled as in Laverna, but the labial palpi are those of *Chauliodus chærophilellus;* the basal joint of the antennae has dependent hairs, and the tufts of scales, though not projecting over the hind margins of the wings, as in Chauliodus, are arranged along the dorsal margin. As I have but a single specimen, I have not denuded the wings.

Head and palpi white; third joint of the palpi is externally marked with about three or four small purple brown spots, and the second joint is externally dusted with scales of the same color towards the base. Antennae brown. Thorax white on top, but marked with some small brown specks, some of which also are scattered over the base of the fore wings, which are white with a large pale yellowish ochreous spot, which crosses the fold at about the basal fourth. The wing behind this spot to the tip, is more or less, though faintly tinged with pale ochreous yellow and grayish, especially so along the middle of the disc, where there are two or three small dark brown tufts of raised scales; there is a bluish gray spot on the dorsal margin before the ciliae, and there is an opposite costal spot of the same hue which also is visible in the ciliae: there are three small tufts of ochreous red scales along the dorsal margin of the fore wings, one of which is near the base, another about the middle, and the third is just behind the, bluish gray patch above mentioned. The legs are brown and the tarsi are annulate with white. *Al. ex.* 3/8 inch.

Additional corrigenda:

Ante p. 30, for L. longiella read langiella.

P. 32, for superbella read elegantella.

P. 10, for buristriga read brevistrigella, and for planisipenella read planipenella.

V. 6, p. 237, pallidagrisseella read pallidegrisseella.

P. 244, for pallidastrigella, pallidestrigella.

BUCCULATRIX.

B. niveella. N. sp.

Snow white, very faintly tinged with yellowish on the front of the tuft and in the apical part of the fore wings, and with a very few scattered brown scales in the costal ciliae, but with two distinct dark brown hinder marginal lines in the dorsal ciliae, one at their base, the other beyond their middle, slightly converging towards the apex. *Al. ex.* a little under half an inch.

The two following species I place with a little doubt in this genus. In Bucculatrix the tongue is short, but with careful observation of both these species, and dissections of one of them *(B. ? magnella)*, I have been unable to discover any trace of a tongue ; the tuft also is larger than is usual in Bucculatrix, and in the hind wings of *B. magnella* the apical vein goes *to* the apex, and the median gives off only a single branch, instead of two. It is also a large species for the genus.

B. magnella. N. sp.

Snow white. There is a rust red spot on the front of the tuft ; a dark golden brown streak along the middle of the fore wings, beginning on the base, but in the apical part of the wing curving down to the base of the dorsal ciliae, and extending thence around the apex. There is another narrow streak of the same hue parallel to it, which begins behind the middle of the wing, and is usually partly confluent with it, and after reaching the base of the dorsal ciliae, it passes on to and through the apical ciliae. There is a dusting of ochreous scales along the base of the costal ciliae, and the apex is suffused with reddish ochreous. *Al. ex.* fully half inch. Season, April and May.

B. immaculatella. N. sp.

No tongue? Silvery white, immaculate. *Al. ex.* $\frac{5}{16}$ inch. Season, May.

BUTALIS.

B. brevistrigella.

This is a very variable species, or my specimens represent more than one species. Sometimes (as stated in the former description) there is simply a yellow streak on the fold, which is sometimes interrupted. In others there is no distinct streak on the fold, but the dorsal margin to the fold, and crossing it near the base of the wing, is densely dusted with pale ochreous yellow, thus approaching *B. dorsipalidella*, which may possibly be an extreme variety of the same species.

ERIPHIA *gen. nov.*

Allied to Elachista and Laverna. Indeed, but for the more elongate palpi, and without having examined the neuration, I should have placed it in Elachista.

Palpi rather long, drooping in the dead insect, divergent; third joint pointed and about half as long as the second. Antennae simple, about as long as the body.

Primaries lanceolate; the submedian is furcate at the base; the cell is truncate (the subcostal and median running nearly parallel, and the discal vein being straight); the subcostal gives off three branches before the end of the cell, and a fourth at the end has a common origin with the fifth or apical branch, which goes to the apex; the discal has a central branch to the dorsal margin, and the median is furcate from the end of the cell, both branches being short. It thus resembles *L. astra* or *L. longiella*, Ins. Brit.

Secondaries linear lanceolate. Internal and submedian veins distinct, the latter furcate on the dorsal margin; median obsolete to the end of the cell, where it divides into two distinct branches; discal short, distinct, closing the cell about the middle of the wing; subcostal indistinct to the end of the cell, where it becomes distinct and bends up to the costa just beyond the middle. (Possibly, however, it would be more correct to consider what I have called the 'internal' as the submedian, and what I have called 'submedian' as the median; and what I have called the 'median' as a furcate branch of the discal continued faintly through the cell to the base. If this view is correct, then the cell is unclosed between the submedian and the furcate discal branch, and thus the neuration of both wings would *resemble* those of *L. longiella*, and the insect would be a Laverna.

E. concolorella. N. sp.

Dark bronzy brown; unicolorous. *Al. ex.* ⅓ inch. Season, July.

ELACHISTA.

E. ? concolorella. N. sp.

Without the aid of a lens, this insect would be mistaken for the preceding. It is, however, quite distinct. The antennae are but little more than half as long as the wings, and the palpi are not much more

than half as long as in *Eriphia concolorella.* I place it somewhat doubtfully in Elachista, because of the neuration, which approaches that of Laverna. The submedian of the primaries is not furcate at the base; the cell is narrow and acuminate, with three subcostal branches to the margin from near the end of the cell, besides the apical branch, which is furcate before the apex, with one of its branches to each margin; the median is also three-branched, the last from the end of the cell almost confluent with the furcate apical branch of the subcostal.

In the secondaries the cell is rather wide, unclosed; the subcostal is distinct and furcate, with a branch to each margin; the median is three-branched (or two-branched, with an independent discal branch arising *at* the median and indistinctly continued through the cell, which is unclosed).

Dark bronzy brown; unicolorous. *Al. ex.* a little less than a third of an inch. Not so slender an insect as *Eriphia concolorella.*

E. parvipulvella. N. sp.

White; a few ochreous yellow scales scattered over the primaries, especially towards the apex. *Al. ex.* scarcely ¼ inch. Season, May, July, August and September.

CORRESPONDENCE.

YOUNG OF POLYXENUS.

DEAR SIR,—

During the past summer I have bred the young Polyxenus from the egg. The eggs were found under the bark of dead pines, and were in masses of about thirty, I should judge; intermixed with them were numerous hairs from the posterior part of the body of the adult. The eggs are translucent white, sometime before the young appear turning somewhat opaque; in shape oval, long diameter barely one-hundredth of an inch.

Length of the young ten hours from the egg, seven two-hundredths of an inch. The young differ in no marked manner from the adult, except in the smaller number of segments, which are four, and in having only three pairs of legs, attached to the three anterior segments. The fourth segment is small and has the two tufts of silvery hair so characteristic of the adult.

HENRY L. MOODY, Malden, Mass.

CROCIGRAPHA.

DEAR SIR,—

On page 230 of the CAN. ENT., Mr. Morrison doubts the propriety of the generic reference of *Perigrapha Normani* Grote. I had previously (Bull. B. S. N. S.) noted the different antennal structure of the American species, not being acquainted autoptically with the European forms. The species of *Perigrapha* are regarded as related to *Taeniocampa* by Lederer, and it was natural that in describing an American species, differing by the presence of a prothoracic tuft, that I should refer it to a genus differing by this character from *Taeniocampa*, to which otherwise both were related. Lederer has divided the genus *Taeniocampa* (which should now be known, as I have shown elsewhere, as *Graphiphora*) into sections already, on peculiarities of antennal structure. There can be no propriety of further enlarging the genus by the admission of species with a tufted thorax, so that I propose the above name for *C. Normani*.

DEAR SIR,—

In Mr. Morrison's letter on page 16 of this volume of the CANADIAN ENTOMOLOGIST, he allows himself to call my statements with regard to certain recently described species, "palpable blunders." In the course of his paper, however, the synonyms I claimed that Mr. Morrison has made are admitted, with the exception of two, *Hadena rasilis* and *Agrotis exsertistigma*. With regard to the former insect, I think it much more nearly resembles Hübner's figure of *grata* than *Graphiphora oviduca* does in habitus, size, ornamentation and color, and my blunder (if I had made one) can hardly be called "palpable." With reference to *Agrotis exsertistigma*, I find that I am in error and that the species is valid. I have not known until now the true *exsertistigma*. Mr. Morrison founded this species on two specimens sent him by myself for description with other material, but neither were returned me with the other specimens. Having no duplicates of the material sent him, I inferred that *exsertistigma* was based on specimens with open orbicular, which I referred to *alternata*, but which I now see are Californian specimens of *A. cupida* Grote. Mr. Morrison's non-return of the specimens merely confirmed me in my own wrong identification of *alternata* Grote, as found in California. I am exceedingly sorry to find myself in double error. In the present case the description of Mr. Morrison has helped to mislead me, since *exsertistigma* has a conical abdomen and should not be compared with either *alternata*

or *cupida*, which have it flattened, while *cupida* varies in California in a character (the open orbicular) which Mr. Morrison uses to separate *exsertistigma*.

To the list of synonyms I have given as recently made by Mr. Morrison, Mr. Morrison adds that of *Orthosia baliola*. They would therefore stand as follows:

1. *Copipanolis vernalis* Morr. = *Eutolype Rolandi*.
2. *Mamestra illabefacta* Morr. = *Mamestra lilacina*.
3. *Anthoptera nigrocaput* Morr. = *X. Ridingsii*.
4. *Orthosia baliola* Morr. = *Apamea purpuripennis*.
5. *Hadena rasilis* Morr. = *Elaphria grata*.

Of these five synonyms, one (No. 4) I had not detected, one (No. 5) is not conceded by Mr. Morrison and three (Nos. 1–3) are now admitted by him.

Mr. Morrison is in error in stating that I remark that his *vulgivaga* is "probably a re-description of *H. apamiformis*." I quote the species on page 215 as a distinct species unknown to me, and merely say "from the description I think it not improbable," etc., which is a very different thing. I make no positive statement with regard to either *sericea* or *vulgivaga*. I am glad that *sericea* is not founded on the specimen sent me as a "n. s." allied to *apiata*, because that *was apiata*. I thought *sericea* might be the insect, because Mr. Morrison disputed my determination and thought it distinct, and because he speaks comparatively of *apiata* in his description of *sericea*.

In CAN. ENT., 6, 250, Mr. Morrison states that "Mr. Grote refers *Ceramica* to *Taeniocampa*." In my paper (Bul. Buff. S. N. S., 2, 122) I give the genera (as elsewhere) separately and distinctly, but cite their names under the same heading in a short synoptical table, with the remark, "I have no perfectly preserved specimens of *Ceramica exusta*, and the structural difference from *Taeniocampa* is not apparent to me," as an excuse for so doing.

Mr. Morrison's remark as to my identification of *Agrotis lycarum* I think is unfairly put. This identification was always made hesitatingly from a figure, and had been finally abandoned before Mr. Morrison had written on the subject. Again, *repentis* G. & R. was described in Europe and the name a ms. one of Guenée's. That we had not then identified *messoria* was, perhaps, pardonable, Mr. Riley also having redescribed Harris' species as *Cochrani*.

I notice, also, Mr. Morrison's remark that I have mistaken the generic characters of *Hydroecia semiaperta*. This species, with hairy eyes, is placed by Mr. Morrison first in *Hydroecia*, a genus which has the eyes *naked*. It was sent to me as a n. s. of *Hydroecia* by Mr. Morrison for examination, and I then returned the species determined as belonging to a genus allied to, but distinct from *Hydroecia*. In the Proceedings of the Academy I merely discuss the priority of the names *Apamea* and *Hydroecia*, show that they are synonyms, and adopt *Apamea* and refer *all* the American species described under *Hydroecia* to *Apamea*. Among them is Mr. Morrison's *semiaperta*. There is not a word as to the structure of the species, and, in fact, I refer to *semiaperta* in the next description as *Hydroecia semiaperta*. It was not my intention then to discuss its structure or erect the new genus, to which I have always in letters stated it to belong.

Mr. Morrison speaks of *nigrescens* as a synonym of *fasciolaris*. I have examined and determined both species as distinct from specimens in the collection of the American Entomological Society. The two are totally, and, I believe, even generically different.

Mr. Morrison allows himself to make an extraordinary statement with regard to one of the few generic names proposed in my List and its Supplement, to the effect that such names without further description need not be adopted. Independent of the fact that it is customary to retain such names as can be proven by the works of Hübner, Ochsenheimer, Walker and many others, the view taken by Mr. Morrison is untenable from the consideration that I have indicated my type and clearly circumscribed the genus by an enumeration of the species in every case. Science is occupied by the fact and not the name; by his criticism Mr. Morrison shows himself affected by the name and not the fact. There can be no doubt that I have made such genera recognizable by including under them described species and thus facts and things admitted by science as existing and already defined. My generic names are as strictly to be preserved in these cases as if they were defined with the minuteness which characterizes Mr. Scudder's definition of *Papilio*. Take, for instance, my genus *Eucoptocnemis*, proposed in my List for the *Heliophobus fimbriaris* of Gueneé. Even the Etymology of the name suggests my reference to Gueneé's statement that his species has armed tibiæ, and my inference that then it cannot be a *Heliophobus*, which has them unarmed. If from such data as this no conclusion can be drawn and no action taken by a

student in my capacity, then large numbers of terms throughout Zoology are liable to be overturned any moment by persons as ill-advised as Mr. Morrison. I cite, for example, Mr. Allen's recently described *Loligo Hartingii*, determined specifically upon a figure.

It is true that Mr. Morrison takes no regard as to the meaning of generic terms, and hence has probably taken no cognizance of the derivation of *Eucoptocnemis*, since he establishes himself a new genus under the name *Eutricopis* (my term *Tricopis* with a common prefix), which belies its designation in having the tibiæ unarmed! Mr. Morrison incorrectly refers *Eucoptocnemis fimbriaris* to my genus *Pleonectopoda*, where it does not belong, just as he incorrectly refers *Eutolype Rolandi* Grote, under the synonym *vernalis*, to my genus *Copipanolis*, where it is equally out of place.

My List of the Noctuidæ will amply attain the ends proposed if it will continue to call forth corrections and additions, and so be of service in perfecting a knowledge of its subject, the Noctuidæ of N. America.

A. R. GROTE.

Buffalo, N. Y.

DEAR SIR,—

I got a number of larvae of *Papilio asterias* in July, 1874, in Fulton County, Ohio, three of which changed to pupae. One of the pupae I poured chloroform over, and when it stopped moving, put a pin through it. A few days after I looked at it, and found it had grown almost black about the wing cases. I broke off the piece of the pupa skin that covers the head, legs and antennae, and was surprised to see it move. The wings would get dry sometimes, and I would put a drop of water on them to keep them moist. At last the time came for hatching, and with my help, the butterfly got out of the pupa case, but could not expand on account of its wings being dry. Yours truly,

ALLEN Y. MOORE.

Fort Buford, D. T.

The Canadian Entomologist.

VOL. VII. LONDON, ONT., APRIL, 1875. No. 4

SUGARING FOR NOCTUÆ.

BY GEO. NORMAN, ST. CATHARINES, ONT.

Having been requested by the worthy Editor of this journal to contribute a few hints on sugaring for Noctuæ, I have endeavored to put together a few notes that may prove serviceable to those who may not have been successful in this method of capture. To begin with, it ought to be a golden rule never to abandon a locality, even should it yield nothing for a few nights. Often have I sugared a new locality night after night, with absolutely no results, but by persevering the moths have become attracted to the place, and, in course of time, were swarming on every tree.

The mixture I have found to answer best is either the common black treacle (not refined syrup), or the very coarsest brown sugar, called, I believe, by the trade, "Jamaica foots." In either case, the sugar or treacle must be thinned down to a proper consistency by means of stale ale, or, what is still better, the thick yeasty residuum from an ale or stout cask. Some collectors add a drop or two of oil of aniseed, and just before brushing on to the trees, a small quantity of rum, but I have really found no benefit from either addition. My receptacle for the mixture is made of zinc, flattened at the sides and rounded at the corners, so as easily to slip into my shooting-coat pocket. It has a brass screw at the neck, with a leather washer, the handle being attached to the brush—an ordinary painter's "sash tool,"—and goes inside the neck and is screwed tight when in the pocket. By this means all soiling the fingers is avoided.

On arriving at my ground, I look for a round with plenty of young trees with stems under twelve inches in diameter, selecting a place interspersed, if possible, by walks and footpaths. The thick, dense portions of woods are of no use, but the outside trees will do very well, provided the trees are not too large and the trunks too rough and corky; choose the trees

of medium roughness, for perfectly smooth ones, such as beech and young poplars, are as bad as those too rough, and rarely pay for the trouble. Spread the mixture on the leeward side of the tree, in a longish patch, at about the heighth of your face from the ground, as near sun set as possible as to time. Then comes a quiet pipe or two until it is dark enough to light the lantern. Never smoke when examining for moths, or you will lose many a rarity. When quite dark, light the lamp and go carefully over the trees.

My lantern is a portable flat one, burning the vapor of benzoline, and is, I believe, called a "sponge spirit lamp." It is far more cleanly than oil. The lantern has a drawer for matches, and instead of having a "bull's eye" in front, has a circular piece of plate glass, with bevelled edges. This arrangement allows the light to spread more than the "bull's eye," and enables one more easily to take the moth with the net, should it try to escape. No one ought to rely upon his chip boxes or cyanide bottle alone, when he goes his round; some moths are proverbially skittish, or fall to the ground and are lost among the herbage, if a hand net is not placed beneath them. The old plan of using a chip box for each specimen is, I think, the best, but many prefer the cyanide bottle. If the moths are left for twelve hours in the bottle they lose much of their rigidity.

In barren places, without trees, the sugar may be applied to stones and rocks, and on the sea shore or on sand hills, pieces of chip or wood may be sugared and stuck in the ground; or, in the event of these being not procurable, heads of thistles or bents *(Ammophila)* may be tied into bundles and smeared with the enticing lure; such localities often yield rare *Agroti*. I have generally found damp, dark nights, with a soft breeze blowing, the best, but have also had most excellent collecting even during the most brilliant moonshine. Some writers recommend sugaring a tree every ten yards or so; my plan has been to sugar every suitable and accessible tree, however near each other. In the spring the catkins of willows and sallows ought to be visited and carefully examined by means of a bull's-eye lantern. Many hybernated moths will be found in company with the Tæniocampidæ. Again, in the autumn the flower spikes of the common reed *(Arundo phragmites)* should be visited after nightfall. In my excursions I usually carry my apparatus, lamp, &c., in a leathern wallet, which is suspended by rings to a stout leather waist belt. This arrangement leaves the shoulders and chest free.

HINTS ON COLLECTING COCOONS OF THE LUNA MOTH—*Tropæa luna.*

BY ROBERT BUNKER.

Many Entomologists are under the impression that the cocoons of this species and *polyphemus* are exactly alike in appearance. This is a mistake ; and the collector who has been misled by writers on the subject and has got together by careful searching a dozen cocoons, expecting at least to get a small share of *lunas* from them, is greatly disappointed when they change to find them all *polyphemus.*

Having had some experience in collecting cocoons of both species, I will endeavor to point out the differences. The *polyphemus* cocoons are white. or dirty white, 1.25 to 1.75 in. long (those producing females the largest), with rounded ends ; sometimes angular, caused by leaves being moulded unevenly to the surface ; generally coated with white powder ; firm in texture, and producing silk of a coarse quality.

The *luna* cocoons are chestnut brown, a little larger than *polyphemus ;* egg shaped ; very thin, and frequently rough on the surface, covered with warts and excrescences ; they seldom show the print of leaves on their surface.

From my own observations, I am strongly inclined to the opinion that the larva of this fair queen of the night seldom spins its cocoon between leaves in the tree, but crawls to the ground and fastens it to any object that comes in its way. This belief has been strengthened by frequently finding cocoons with grass moulded to their surface ; furthermore, last fall I found a cocoon firmly attached to a tuft of grass six or eight inches from the ground, and another fastened to a twig or sucker about the same distance from the ground ; add to the above the fact that cocoons are almost always found on the ground near the trunk of the tree, and we have a pretty clear case that the habits of this elegant species are quite different from those of *polyphemus.*

Hickory, Beech and Oak are the food plants of this species ; *polyphemus* has a much wider range, and is, consequently, far more numerous. In collecting I find about six of the latter to one of the former.

Spring is the best time to search for cocoons, as most of the leaves blow away during the winter, leaving the cocoons exposed to view ; it is best, however, to look for them both in fall and spring.

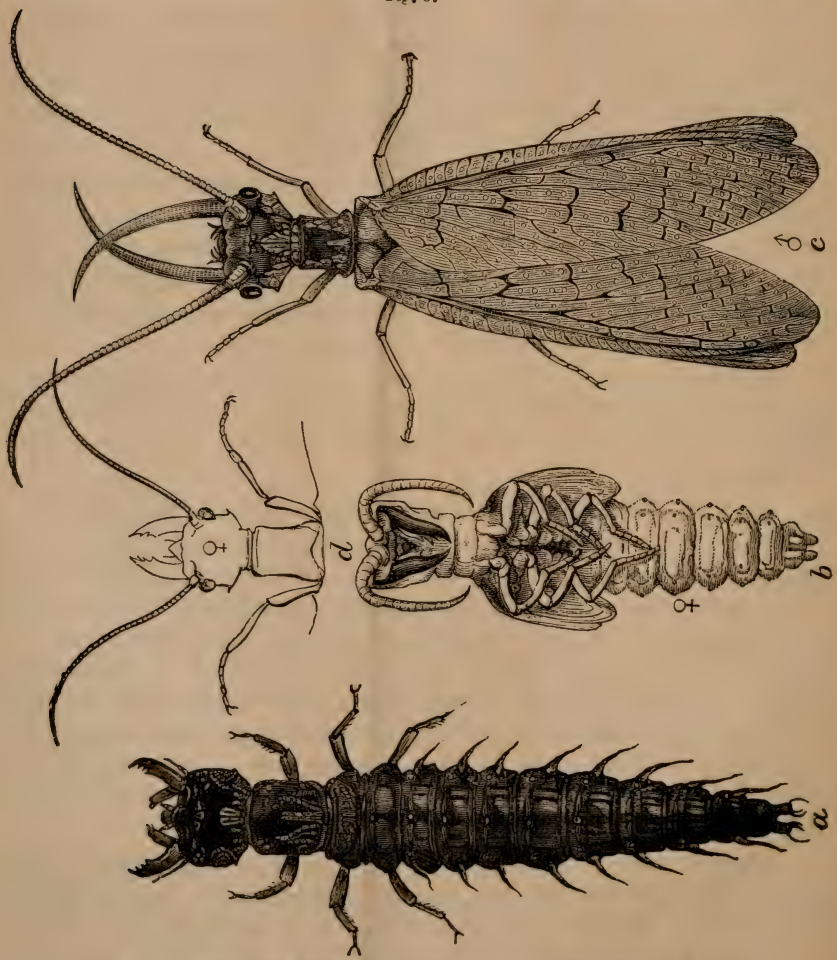
ON SOME OF OUR COMMON INSECTS.

THE HELLGRAMMITE FLY—Corydalis cornutus Linn.

BY THE EDITOR.

This insect is common throughout Ontario, and wherever found, either in its larval or perfect state, excites astonishment and curiosity, owing to its immense size and formidable appearance ; it is not, however, in any way poisonous, as some imagine. In fig. 9 this insect is represented in

Fig. 9.



Colors—(*a*) dark brown, (*b*) whitish, (*c*) and (*d*) light brown.

its several stages, while in fig. 10 the perfect female is shown with wings expanded. The larva, which is a diabolical looking creature, is seen at *a*, fig 9 ; it spends the earlier portion of its life in the water, crawling and swimming about upon the bottoms of rivers and streams, feeding upon

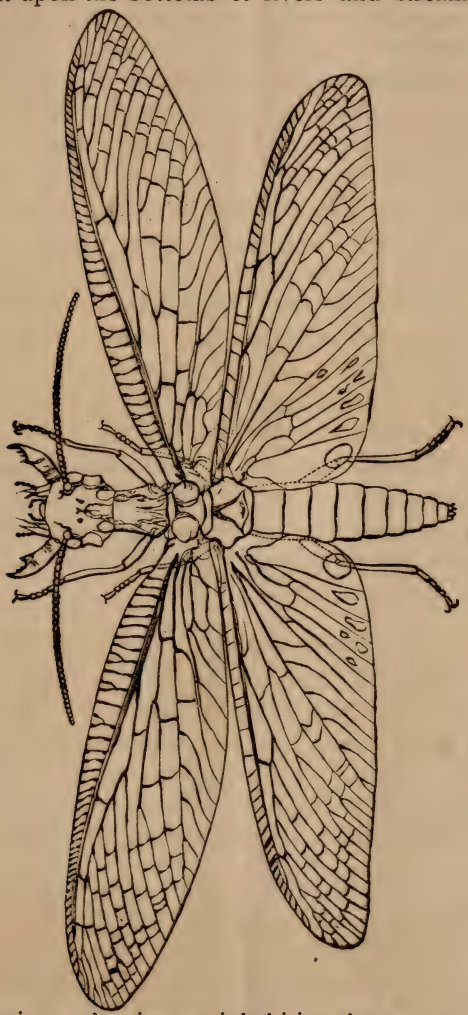


Fig. 10.

the larvae of various other insects inhabiting the water. Mr. Riley has published an excellent paper on this insect in the first volume of the *American Entomologist*, from which most of the remarks following are condensed.

Most aquatic larvae spend the period of their chrysalis state in the water, and only emerge therefrom when ready to pass into the perfect or winged state; but the insects forming the group to which this larva belongs, leave the water while they are still in the larval state, and do not usually become pupae for several days or even weeks thereafter. Hence the Creator, to meet their necessities, has given them a double system of respiration—a set of gills to breathe with in the water, and a set of breathing holes, or spiracles, to breathe with upon land. In this larva the gills assume the form of paddle-like appendages, and are placed one pair upon each of the seven front segments of the abdomen, while the spiracles are arranged in the usual manner along the sides of the body. After leaving the water the larva crawls rapidly about, chiefly in the night time, in search of a safe and suitable place in which to spend the chrysalis stage of its existence, usually selecting the under surface of a flat board or log, or burrowing under some large stone. Before attaining its object, it sometimes wanders as much as a hundred feet from the water's edge, and an instance is given of one which crawled up the wall to the roof of a one-story building, and then tumbled accidentally down the chimney, to the great dismay of the good woman of the house. At this stage of their existence they are sometimes used by fishermen for bait, and having a very tough skin, one larva often suffices to catch several fish. They can pinch pretty sharply with their strong jaws, and they use the processes at their tail to assist them in climbing.

After a suitable hiding place has been selected, the larva forms a rude cell in the earth, and here changes to an inactive chrysalis (see fig. 9, *b*.) In this figure the wing cases are slightly spread apart from the body to show their shape and structure, whereas in nature they are closely appressed to the sides of the body. The larva leaves the water usually about the beginning of June, and by the end of that month, or the beginning of July, the perfect insect bursts its bonds and appears in the winged state.

In this form it measures, when its wings are spread, from four and a half to five inches; these, as shown in the figure, are gauze-like and covered with an intricate network of veins. The forewings are streaked with dark brown and sprinkled with whitish dots, of which latter there are also a few on the hind wings. The male (fig. 9, *c*) is remarkable for its enormous jaws, which are very long and hook-like, while the female (fig. 9, *d* and fig. 10) has short jaws. The flies hide themselves in obscure holes and corners during the day, and become active as the shades

of evening gather. They frequently fly into houses situated near running water, soon after dusk, attracted probably by the light.

The eggs of the Hellgramite Fly are oval, about the size of a radish seed, and of a pale color, with some dark markings. They are usually deposited in patches, upon reeds or other aquatic plants overhanging the water, where, when hatched, the young larva may find ready access to that element which is destined to be its home until the end of the following spring.

PRELIMINARY LIST OF THE NOCTUIDÆ OF CALIFORNIA.

Part V.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

105. Agrotis vittifrons Grote, Proc. Ent. Soc. Phil., 3, 527, pl. 5, fig. 6.

Nevada, Mr. Hy. Edwards, No. 5645, one ♀ specimen. I think I may have mistaken the sex of my original type, and that it is a male. The present specimen seems to differ by the costal band and collar being leathern brown, the orbicular tolerably distinct, and the cell suffused with blackish. The hind wings are blackish fuscous.

106. Agrotis silens. N. sp.

♂. The antennæ are brush-like. Fore wings hoary over fuscous, with the costal region and stigmata gray. A black basal dash and black shading on the cell between the ordinary spots, which are moderately sized, sub-equal, the orbicular incomplete superiorly. Ordinary lines obsolete. The t. p. line indicated by geminate marks on costa above the reniform, and elsewhere feebly noticeable. Veins indistinctly darker marked. The black cell shading less distinctly continued to s. t. line between veins 4 and 5. Subterminal line indistinct, gray, preceded by more or less distinct black interspaceal marks. Apical shade gray; terminal space darker, fuscous. Terminal line black, fringes pale fuscous tipped with a faintly brown basal shade, and improminently interlined with

pale. Hind wings whitish, smoky about the margin, with white fringes. Thorax and head like fore wings, Collar with a black line. Front with two short black lines. Lower portion and tips of palpi pale. Abdomen griseous, with a stigmatal black line. *Exp.* 35 m. m.

This species is stouter than *rudens*, of a rougher appearance, and it differs by the more deeply stained hind wings, the open orbicular and the general color. The fore tibiæ are wanting in the specimen.

Nevada, Mr. Hy. Edwards, No. 5603.

107. Agrotis excellens Grote, Proc. Am. Ent. Soc. (1875).

Vancouver's Island, Mr. Hy. Edwards, No. 5570.

108. Agrotis intrita Morrison, Proc. Bost. S. N. H., 1874, 164.

♂. Antennae coarsely brush-like. All the tibiae spinose. Rich deep brown, with an olive ochre stain, which tinges the thorax and the markings of the fore wings. Thorax and head concolorous with fore wings. These latter are of so intense and even a color that the markings are obscured. The ordinary lines are deep blackish, geminate, with paler fillings. Orbicular round, the black annulate with a pale interior lining. Claviform rather large and pointed. Reniform moderate, with an indistinct interior annulus, the stigmata well separated and without discal suffusion. T. p. line lunulate, even in its general course, not inwardly bent below the median vein. Subterminal line indistinct, pale, of the usual irregular shape, continuous. The dark fringes are interlined with pale. Hind wings and fringes unicolorous, light fuscous, without marks. Abdomen like hind wings, with ruddy lateral and inferior tinting. Beneath the wings are without lines, clouded, subirrorate, hind wings with an obsolete point and largely pale inferiorly. *Exp.* 30 to 32 m. m.

Mr. Hy. Edwards, Nos, 5646, 5640, 5607, Vancouver Island.

Mr. Morrison has identified a specimen without which I could not have known his species, since he compares it briefly with *phyllophora*, to which it bears no near resemblance.

109. Agrotis pastoralis. N. sp.

♀. Antennae simple; all the tibiae spinose. Wings elongate. Thorax and fore wings dull black. All the markings faint. Orbicular small, spherical, interlined with pale powdery scales. Reniform of the usual shape, well removed from the orbicular, more prominently interlined with

pale powdery scales than the orbicular. Lines obsolete. Hind wings wide, blackish fuscous, without marks. Fringes white outwardly. Beneath paler, irrorate, with shaded faint common band and discal marks. *Exp.* 42 m. m.

Vancouver Island, Mr. Hy. Edwards, No. 5638.

This is a large species, differing decidedly from *velleripennis*.

A specimen sent by Mr. Theo. L. Mead, collected in Colorado, differs by the general tone being more fuscous, less blackish, with the t. p. line faintly legible. I think it is the same. Mr. Mead's number is 51.

Agrotis gagates. N. sp.

♀. A single specimen collected by Mr. Mead, in Colorado, and sent to me under the number 56, is closely allied to *pastoralis*, but differs by the color of the fore wings and thorax being of an intense red brown, very much like that of *Hadena lateritia (dubitans* Walk). The abdomen is red tinted beneath. The subterminal line is pale, distinct, powdery, continued, of the usual irregular shape. There is no trace of it in *pastoralis*. *Expanse* 43 m. m.

In this Coloradian species the t. p. line is visible through a lighter succeeding tinting; it is not bent down below the cell, and is slightly and regularly lunulate.

110. Bolina hadeniformis Behr. Trans. Am. Ent. Soc., 3, 25.

Downieville (Behr.) Unknown to me. Dr. Behr also describes specimens doubtfully under the names *jucunda* and *cinis*.

111. Syneda Edwardsii Behr, Trans. Am. Ent. Soc., 3, 28.

California, Mr. Hy. Edwards, No. 89. Two specimens.

112. Syneda ochracea Behr, Trans. Am. Ent. Soc., 3, 25.

California, Mr. Hy. Edwards, No. 1267.

113. Syneda socia Behr, Trans. Am. Ent. Soc., 3, 27.

California, Mr. Hy. Edwards, No. 52. One specimen from Santa Barbara.

114. Syneda Howlandii Grote, Proc. Ent. Soc. Phil., 3, 533, pl. 6, fig. 7.

Mr. Edwards sends me a specimen of *Syneda Stretchii* Behr, from Nevada, which will, I think, prove identical with my previously described Coloradian species.

115. Syneda divergens Behr, Trans. Am. Ent. Soc., 3, 27.

Sierra Nevada, Mr. Hy. Edwards, No. 4307.

116. Syneda adumbrata Behr, Trans. Am. Ent. Soc., 3, 27.

Sierra Nevada, Mr. Hy. Edwards, No. 2262.

I do not think that either of these two latter species is the same as our Eastern *graphica*. *Divergens* is nearer to *hudsonica*. If the differences which separate these Californian forms are really of specific value, it may eventuate that the specimen figured as the ♀ *hudsonica* is a distinct species. Having only single specimens of the Californian species, and without my types of *hudsonica*, I cannot attempt to offer any conclusions.

117. Syneda Tejonica Behr, Trans. Am. Ent. Soc., 3, 26.

Fort Tejon (Behr.) Unknown to me.

118. Syneda nubicola Behr, Trans. Am. Ent. Soc., 3, 25.

Tuolumne River (Hoffman.) Unknown to me.

119. Syneda maculosa Behr, Trans. Am. Ent. Soc., 3, 26.

Tuolumne River (Behr.) Unknown to me. These two species may belong to a different genus.

120. Lita sexsignata Harvey, Bul. Buff. S. N. S., 2.

Nevada, Mr. Hy. Edwards, No. 5536; California, Mr. Crotch in Mus. Comp. Zoology, Cambridge.

Behrensia. N.g.

Allied to *Plusia*. The head is sunken; eyes naked, lashed; labial palpi with obtuse terminal article, second joint loosely haired. Maxillae stout. Collar produced in front so as to stand off from the prothorax. Thorax tufted behind, but apparently without the large dorsal tuft of *Plusia*. Abdomen with a fan-shaped mesial tuft, which is concave on the face, directed towards the abdominal tip; sides tufted; body pilose. Antennae pubescent, simple. Ornamentation resembling *Abrostola*.

121. Behrensia conchiformis. N. s.

♂. Thorax and fore wings blackish gray. Median lines deep black, distinct, sinuous, geminate; a fine line precedes the t. a. and succeeds the t. p. line. T. a line with a costal tooth, rather deeply undulate. Median space much shaded with black, obscuring the rounded claviform. Orbicular large, round, whitish, with dark centre. A white shade obtains between the spots, extending below the median vein, and touches the large reniform, which has a dark central streak touched with green. Green and slightly orange scales are scattered along the subcostal vein, along the obsolete basal half line, beyond the t. p. line, and the scalloped terminal line is green, of the light hue of copperas. Subterminal line faint, pale. Hind wings pale in the disc, the pale portion neatly defined by a mesial black streak. Beneath the mesial black line is distinct and denticulate, and the white disc shows a black streak less noticeable above. A second, sub-basal line is costally visible. Fore wings show a black curved extra mesial line, else both wings are blackish gray. The body hairs beneath are tinged with reddish, as in some species of *Plusia*. *Expanse* 29 m. m.

Mr. Behrens, No. 226, California (Sauzalito).

The handsome species appears to me to differ generically from any of the forms included by Lederer in *Plusia*, by the obtuse, dependent third article of the loosely held, hanging palpi. The collar is unusually projected, without being broad. The head is more sunken than in any species of *Plusia* known to me. The base of the antennae are shielded by long hair tufts.

122. Graphiphora Behrensiana. N. s.

The eyes are hairy. The fore wings are coarsely irrorate with black, of a dull brown ground color, darker to the pale subterminal line, beyond which they are paler, with the veins pale marked. The costal edge is carneous. The lines are pale, tolerably approximate on internal margin, rather even, with blackish margins, the t. a. line outwardly oblique, the t. p. line flexuous. Ordinary spots large, pale margined, fused, so that there is a resemblance to some species of *Glaea*. Hind wings soiled white, sparsely irrorate, with a discal dot, concolorous fringes and a broken terminal line. Beneath whitish, a continuous line on primaries, dotted on the hind wings; discal marks double on fore wings; very distinct on secondaries. *Expanse* 35 m. m.

Mr. Behrens, Sauzalito, No. 227.

ERRATA.—Page 27, for "*illaudibilis*" read "*illaudabilis.*" Page 28, dele "*atlantica, subjuncta,*" and insert "*mactata.*"

PARASITIC DIPTERA.

By the kindness of Baron Osten-Sacken, of Cambridge, Mass., we have been favored with the following notes :

Gaurax anchora Loew., Centur., vii, 94.

Numerous specimens of this insect have been bred by Baron Osten-Sacken from a cocoon of *S. cecropia.*

Blepharopeza adusta Loew., Cent., x, 67.

Examples of this species have been reared from the caterpillars of *Spilosoma acrea* by Mr. H. Edwards.

LOCAL LISTS OF BUTTERFLIES.

All our American readers who are collecting Diurnal Lepidoptera, in whatever part of the country they may reside, would confer a great favor on us by sending lists of the names of such species as are found in their neighborhoods, stating at the same time whether the species are abundant or otherwise. If a general response can be obtained to this request, we shall be able to present our readers with a tabulated list, showing more correctly and completely than has heretofore been known, the distribution of the various species of butterflies throughout America. Such information is very desirable, and would save those at present engaged in the study of this interesting family, as well as any who may hereafter enter on it, an immense amount of correspondence. Mr. W. H. Edwards, of Coalburgh, W. Va., has kindly undertaken to tabulate all the lists that may be sent in, and when completed, publish the material in our pages. We hope our friends will all aid in this desirable undertaking, and each contribute his mite, sending the lists as complete as possible. Lists will be acknowledged in the ENTOMOLOGIST in the order in which they are received.

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 56.)

DRYOPE.

D. luteopulvella. N. sp.

Pale yellow, sprinkled with pale fuscous. *Al. ex.* $\frac{7}{10}$ inch.

I have also taken it in Kentucky, and have received it from Miss Murtfeldt from St. Louis.

AETOLE, *gen. nov.*

Belongs to the Elachistidæ, but is quite distinct from any genus known to me, approaching perhaps as near to Heliozella as to any other.

Tongue long and naked; no maxillary palpi; labial palpi *very* short, drooping, the third joint pointed, about as long as the second; forehead wide, obtuse; face wide but little retreating; scales of the head appressed. Eyes moderate, scarcely visible in front; antennae about as long as the body, simple, rather thick, the basal joint short.

Primaries lanceolate, scarcely caudate, but with the apical part narrow and pointed; cell closed by a somewhat oblique discal nervure; the subcostal gives off two branches before the end of the cell, and attains the margin before the apex; the discal gives off two branches, the superior being furcate before the apex, with one of the branches to each margin; the median is furcate from the end of the cell, and the submedian not furcate at the base.

Secondaries narrowly lanceolate; costal vein very short; median distinct; cell unclosed; subcostal obsolete to the middle of the wing, thence furcate with one branch to the apex and the other to the dorsal margin, and there is an independent discal? branch to the dorsal margin.

A. bella. N. sp.

Head, thorax, base of primaries, with a short basal streak near the margin, and the antennae, are dark slate brown, iridescent or silvery according to the light. Primaries reddish orange, with the base and basal streak, on the fold, a spot before the middle of the dorsal margin, another

a little further back near the costal margin, another on the dorsal margin about the middle, and a small costal one opposite to it, and a wide band around the apex of the ciliae, of the same iridescent brown with the head and thorax. Ciliae dark brown, of a different hue from the band at their base; this band and the costal and dorsal spots are margined by some deep maroon brown scales. Sides and under surface of the thorax reddish orange. Abdomen and legs of the same hue with the head and wing spots, and the metathoracic legs have a reddish orange patch on the anterior surface of the tibiae. *Al. ex.* ¼ inch. Season, August. A very pretty little species.

Perhaps I am wrong in placing Aetole among the Elachistidæ, as I am not certain that it does not more properly belong with Tinagma, Perittia, Douglasia, &c., which Mr. Stainton, in Ins. Brit., v. 3, has placed in the family Glyphipterygidæ. But neither in the brief accounts there given, nor in the figures can I discover any reason for separating these genera from Elachistidæ; nor, from the formation of such a heterogenous group as Mr. Stainton's Glyphipterygidæ seems to me to be, Acrolepia, Roslerstammia, Glyphipteryx and even Aechmia seem to me to belong as properly in Gelechidæ as Butalis does, and more properly than do either Pleurota or Harpella. On the other hand, Douglasia, Perittia and Tinagma might be placed in Elachistidæ with perhaps as much propriety as Heliodines, Bedellia, Chrysoclista or Asychna. As to some of these genera, as Tinagma, Perittia, Antispila, &c., it seems to me there is much force in the suggestion of Dr. Clemens in one of his letters, published by Mr. Stainton in his edition of the Clemens' Papers, to separate them from Glyphipterygidæ, and form, by their combination with some genera now included in Lyonetidæ, a new and more homogenous genus. As before hinted, Lyonetidæ does not seem to me to be a much more homogenous group than the Glyphipterygidæ.

But I do not pretend to criticise the work of much better Micro-Lepidopterists than I ever expect to be. These are simply my reflections on reading some of the writings of Mr. Stainton and Dr. Clemens, the only authorities within my reach. *Glyphipteryx impigritella* Clem., two, or at most, three species of Lyonetia, a few of Antispila and Butalis, are the only genera above named which are known to be represented in this country; and for the other genera above named I have no authority to consult but Mr. Stainton. *Aetole bella* resembles closely the European *Chrysoclista lineella.*

GRACILARIA.

G. (Corisceum) quinquistrigella. N. sp.

Head, face and palpi white, except the outer surface of the tuft and an annulus about the middle of the third joint at its tip, which are grey brown. Primaries grey brown, margined all around by white, widely so on the dorsal margin, but confined to the extreme costa on the costal side, and about five short, oblique, white costal streaks in the apical part of the wing, some of them indistinct. *Al. ex.* $\frac{3}{16}$ inch.

NEPTICULA.

N. Belfragrella. N. sp.

Face pale yellowish; eye-caps white; antennae brown; thorax and primaries pale gray, darker towards the apex of the primaries, and with a fuscous spot at the apex. *Al. ex.* from 2½ to over three lines. Season, April.

COLEOPHORA.

C. bistrigella. N. sp.

Antennæ and palpi simple. The neuration is that of *C. anatipenella*, Ins. Brit., v. 3, except that in the secondaries the subcostal goes to the apex, with a branch to the dorsal margin; and the median is three branched, the last branch continued through the cell, and its connection with the second branch is faint.

Pale sordid ochreous, with a slight reddish cast on the primaries; extreme costal margin white almost to the ciliae, and a white streak from the middle of the base almost to the dorsal ciliae; dorsal margin towards the base whitish, faintly tinged with ochreous; space between the veins in the apical part of the wing darker than the general hue. *Al. ex.* half inch.

C. argentialbella. N. sp.

Palpi and stalk of the antennae simple; basal joint of the antennae tufted.

Silvery white; apical part of the primaries *very* sparsely dusted with scattered dark brown scales. *Al. ex.* half inch. Season, June and July.

Four specimens, only one of which exhibits the dusting, and it also shows in some lights a very faint, pale golden tinge; possibly it ought to be considered specifically distinct, but I think not.

ANNUAL MEETING OF THE LONDON BRANCH.

The annual meeting of the London Branch of the Entomological Society of Ontario was held at the residence of Mr. A. Puddicombe, on the 21st January, 1875.

The following officers were elected :

President, H. B. Bock ; Vice-President, G. Geddes ; Secretary-Treasurer, J. M. Denton ; Curator, C. Chapman ; Auditors, J. H. McMechan and J. Griffiths.

SYNOPSIS OF NEUROPTERA.

Dr. H. A. Hagen, of Cambridge, Mass., is working on a new and largely augmented edition of his Synopsis of the Pseudo-Neuroptera and Neuroptera of North America, and would like the co-operation of all those interested in this department of Entomology. Collectors having undetermined specimens would aid in this good work by forwarding them to Dr. H. A. Hagen, Museum Comparative Zoology, Cambridge, Mass., who will willingly name them ; the only privilege he claims is to retain for the Museum new, or rare species, which he would find necessary to describe.

CORRESPONDENCE.

ON CALOCAMPA.

DEAR SIR,—

In a paper published in the Annals of the Lyceum of New York, Mr. Morrison discusses my views on the relationship between the North American and European species of this genus. So far as they relate to the resemblance between the American *nupera* and the European *vetusta*, Mr. Morrison may be correct, and my later statement that the species cannot be regarded as "representative," incorrect. Mr. Morrison, however, charges me with saying that "*nupera* is more closely allied to *exoleta*" (i. e., than to *vestuta*), which I have never stated. I say in the

Proc. of the Academy of Natural Sciences, that "*C. nupera* appears to me to resemble the European *C. exoleta*, rather than *C. curvimacula*, in opposition to Mr. Morrison's opinion on the subject." I intended to dissent from Mr. Morrison's assertion that *C. curvimacula* may stand for the American representative of *C. exoleta*, by showing that *C. nupera* was nearer *both* the European species than *C. curvimacula*. In regard to the position of *solidaginis*, I consider it the type of a distinct genus, following Hübner and Stephens. Guenée refers the species to *Cloantha*, Lederer to *Calocampa*. Now that we have a closely allied North American representative, and that Mr. Morrison himself gives us at least a single "material structural difference," I feel warranted in considering my adoption of *Lithomia* for *solidaginis* and *germana* authoritative and reasonable.

A. R. Grote.

ON ADITA.

Dear Sir,—

Mr. Morrison recently corrects my statement that the tibiae are spinose in this genus. Mr. Morrison says that "the only spines visible are the pair before the spurs on the middle tibiae and a single spine (there possibly may have been two) between the two pair of spurs on the hind tibiae." I have re-examined my specimen, and I find on the outside of the middle tibiae a series of eight spines in irregular pairs before the spur, besides several finer spines, and on the hind tibiae three spines are plainly visible. The spines frequently break off, as has been noticed by European Entomologists. Perfectly fresh specimens will probably show he presence of more spines on the hind tibiae. The fore tibiae are furnished with a stout, terminal claw.

A. R. Grote.

In reply to Mr. Morrison's enquiry as to the propriety of retaining *Cirroedia* Guen. (1839) instead of *Atethmia* Hubn. (1816) for a genus of Noctuidae, I would state that I gave the subject careful consideration when preparing my "List." I was finally led to adopt the older name from the following considerations. Dr. Herrich-Schaeffer (Corr.-Bl., 75) remarks that he doubts the validity of Guenée's genus *Atethmia* for the South American species. The point is here as to *subusta*, of which Mr. Morrison says that it is "South American," as if he were giving a structural character. Again, Atethmia is dated 1816, and although Hübner

adds a species "*subusta*" to the genus, such a species was not then published. Hübner's *Atethmia subusta* is given later, in 1823, in his Zutraege, under the numbers 205, 206. Now, Hübner cites in the Verzeichniss "105—106." Perhaps he had intended a different and earlier publication of *subusta* than that which was ultimately carried out. There is also some evidence that Hübner considered the European, and not the South American species as typical of the genus *Atethmia*, to be gathered from the text of the Zutraege itself.

Again, Mr. Morrison says that Gueneé "takes out" of Hübner's genus the European *Xerampelina*. Gueneé, however, in his Essai takes no cognizance whatever of Hübner's generic reference of his species. Gueneé says of *Xerampelina:* L'unique espéce qui compose ce genre a été placée *jusqu'ici* dans les Xanthies. Again, Guenée in his "Speciés General" does not, as Mr. Morrison states, refer *subusta* as the typical species of Hübner's genus. Gueneé there does not know *subusta* at all, and says of the genus: "Ce petit genre, dont je n'ai emprunté a Hübner *que le nom*, puis que dans son Verzeichniss, il se compose principalement (!) de *mes* Cirroedia," etc.

The question is one to which I had devoted considerable study, and in a more general List of our moths, upon which I am engaged, I expect to have occasion to note further evidence as to the use of *Atethmia* in European works for *Xerampelina*. I shall be glad always to note corrections to my List, which deviates so greatly from its predecessors that it should not be expected to be everywhere exhaustively correct. And although Mr. Morrison may not always be able "to see the necessity of this change," yet he will find that no generic title is there adopted without a reason.

A. R. Grote.

Dear Sir,—

Mr. Grote's letters in your last issue seem to contain, in the main, the reasons why he made certain errors in regard to my work, and a repetition of his former statement, to the effect that I had made five synonyms in one of my papers containing descriptions of about sixty species; the former statement does not call for any word from me, but perhaps it would not be out of the way (since we are on the subject of re-descriptions of old species) to ask why Mr. Grote has re-described within six months the common *Agrotis incivis* Guen. as a new genus and species, under the title of *Anicla Alabamæ;* or why the well-known *Orthosia ferruginoides*

Guen. is re-described as *Xanthia ralla* G. & R. ; or *Acronycta brumosa* Guen. and *innotata* Guen. as *A. verrilli* G. & R. and *Diphthera graefii* Grote ; or *Celiptera frustulum* Guen. as a new genus and species, *Litomitus elongatus* Grote ; or *Plusia ou* Guen. as *Plusia fratella* Grote; or —but we say no more. It is only human for the best of naturalists to make mistakes occasionally.

In regard to the latter statement of Mr. Grote, it is perhaps unnecessary to repeat again that of the five species of mine which Mr. Grote considers as synonyms, three were published in papers contemporaneous with mine, having priority by one day, and which I could not have foreseen; one was published on the authority of Mr. Grote himself (*Mamestra illabefacta*), and the other (*Hadena rasilis*) is not a synonym, but a distinct species, and Mr. Grote is in error in considering it identical with *Elaphria grata* Hübn.

In ignoring Mr. Grote's genera *Eucoptocnemis*, *Exyra* and others, I simply follow the example of Dr. Speyer and the best European authorities in not recognizing catalogue names unaccompanied by a generic description.

With regard to Mr. Grote's remarks on my genus *Eutricopis*, I consider *Tricopis* (which, by the way, is a synonym of *Euleucyptera*, founded by the same author) as a generic term covering all the characters of the insect or group of insects which it was founded to contain; the three-clawed tibiæ is but one of many characters. Therefore, when I discovered a genus which approached *Tricopis* in many of its characters, but was sufficiently distinct from it, I very properly gave it the name of *Eutricopis*.

Mr. Grote does not agree with me when I unite *Bolina nigrescens* G. & R. with *fasciolaris* Hübn. *Bolina fasciolaris* is a very common and variable species; I have examined a large series, among which many agree with Grote and Robinson's excellent figure, and as they are from the same locality, Texas, I have no doubt that it is their species which I have identified. I have also carefully examined several copies of Hübner's figures, and am confident that the two species are identical.

Mr. Grote closes with some remarks in regard to his "List," the great value of which I cheerfully acknowledge; however, it is open to criticism in many particulars; for instance, the omission of several of M. Guenée's species, one of the omitted species being described by Mr. Grote under a different name, and is in addition placed in a genus to which it by no means belongs. I also object to the admission at present of the genus

Ammoconia to our fauna. *A. badicollis* Grote, referred to that genus in the List, is a true *Agrotis*. I have examined the two European species of this genus, and am satisfied that it can not be retained there.

I remain yours truly,

—— H. K. Morrison.

Dr. Harris, writing to Hentr. (Harr. Cor., p. 11), says: "Have you ever seen a *Rhagium?* In January I obtained from beneath the bark of a tree nearly twenty males and females of *R. lineatum* Oliver."

My object in writing is to ask your readers if they have ever found *R. lineatum at such a time of the year and in such a situation.* In the summer of 1873 (being absent from home I cannot give the exact dates but probably in May or June) I spent a week in Baltimore, Md., and every morning captured several examples of this species on the walls of a church—none elsewhere. I learned from Mr. Baumhauer, of that city, that he also had taken the same species at the same place several year, in succession. W. V. Andrews, New York.

RARE CAPTURES.

On the 15th Sept., as my brother and myself were returning from an Entomological foray, I saw something like a flash of orange light flit past me, and turning, I saw an insect which I did not know was found here, viz., *Colias eurytheme.* Away it was flying like a ray of sunlight, flitting from flower to flower, resting only for about the smallest conceivable portion of time, and it was only after a long and exciting chase that I managed to capture my prize. It was in beautiful condition, apparently just fresh from chrysalis, and I consider myself very lucky in obtaining it.

Among our rarities, I would also mention a very fine specimen of *Smerinthus modesta* which I obtained from a friend who found it clinging to the eaves of his cottage. We have also among our Catocalidæ, a specimen of *C. concumbens* with abdomen of a bright pink on the upper surface, closely resembling the European *C. pacta* in this respect, only the color is not quite so vivid. C. W. Pearson, Montreal.

Corrections.—Gaspé is on the *south* shore of the St. Lawrence, opposite Anticosti. In my note on p. 18 regarding *P. brevicauda*, you make it north. Also, Mr. Edward's name should have been inserted as the writer of the leading quotation in the article on *Glaucopsyche Couperi*. —Wm. Couper, 67 Bonaventure St., Montreal.

[From the American Naturalist, Vol. ix, March, 1875.]

The Geometrid Moths. — The undersigned, desirous of perfecting as far as possible a monograph of the Geometrid moths, would beg the assistance of collectors, especially in the western and southern states, during the coming season. He would like information especially regarding the early stages, viz.: specimens and descriptions of the larva, chrysalis and their habits, as well as the food plants of any, even the most common species. Due credit will be given for any new facts. Out of about four hundred species in North America, we know of the caterpillars of but about twenty species. A number of illustrations[1] on the next page show the forms characteristic of this extensive family. The caterpillars are loopers or geometers, and are very familiar objects, feeding usually on low bushes and herbaceous plants late in summer.

As every species known is to be figured, it is hoped that entomologists will lend their rarities, and thus aid in the publication of what, it is hoped, will be a useful contribution to the study of our moths. To those aiding by the loan of over twenty specimens, a copy of the work will be sent. The larvæ can be reared easily; full instructions may be found in the "Directions for preserving and collecting Insects," recently published by the Smithsonian Institution, and which can be had on application to the subscriber.

Any moths of this family sent to the subscriber will be named and carefully returned if desired. The work is about ready for the press, and specimens are desired at once. The collecting season is May, June and July, in the middle and northern states, June being the month when they are most abundant. — A. S. Packard, Jr.

[1] Most of the cuts are kindly loaned by Prof. F. V. Hayden, having been taken from his annual report for 1873 on the Geology of Colorado Territory.

Eufitchia ribearia.

Euaspilates spinataria.

Macaria Californiata.

Marmopteryx tessellata.

Aspilates 4-fasciaria.

Drepanodes varus, with larva and pupa.

Caulostoma occiduaria.

Anisopteryx vernata.

EXAMPLES OF GEOMETRID MOTHS.

[Printed at the SALEM PRESS, March, 1875.]

The Canadian Entomologist.

VOL. VII. LONDON, ONT., MAY, 1875. No. 5

SOME NOTES ON LYCÆNA PSEUDARGIOLUS.

BY W. H. EDWARDS, COALBURGH, W. VA.

In September, 1873, Mr. T. L. Mead, who was then at Coalburgh, observed a ♀ *pseudargiolus* depositing eggs upon the flowers of *Actinomeris squarrosa*, and on examining the flower heads found a number of eggs. He brought home two of the females, and enclosed them in a muslin bag upon the flower heads of the same plant, near my house, the plant being not at all an uncommon one here. Several eggs were soon deposited, and in due time the larvæ were hatched and some of them were carried through to chrysalids, a change which occurred about the middle of October. The flowers of *squarrosa* becoming scarce before the caterpillars were mature, I tried the flowers of an allied plant, *A. helianthoides*, and found them to answer equally well. The eggs are laid singly on the still undeveloped flower, and the larva feeds on the petals or eats its way to the seed vessel. In no instance have I seen it feed upon the leaf of the plant. The chrysalids of this lot were found to be dead in the spring of 1874.

In September, 1874, I noticed the females of same species hovering about *squarrosa*, and confining some of them as before, obtained eggs, and three of the larvæ from these I succeeded in bringing to chrysalis. Late in the winter the chrysalids were placed in the greenhouse, and on the 13th of Feb'y, 1875, there emerged from them three true *violacea*, 1 ♂, 2 ♀. This unexpected result shows *violacea* to be the spring form of *pseudargiolus*. *Violacea* never appears here after the last of April or the first few days of May. If the weather is pleasant through April, it is extremely abundant from the first to the middle of the month. The first *violacea* which appear come in the warm days of March, so that their entire period in the imago is not far from six weeks, and after that no more are seen till the following spring. On the other hand, *pseudargiolus* appears from the 10th of May to the 1st of June; about the 1st of July there is a second brood, and one or two others during the summer.

In the light of this discovered relationship, it becomes a question as to *neglecta* and *lucia*. I am prepared to believe that *neglecta* may prove to be one of the summer broods of *pseudargiolus* in this latitude, but the point can only be determined by breeding from the egg. There are differences between the two forms sufficient to make me regard them as distinct till the contrary is proved. Moreover, Mr. Saunders found the larva of *neglecta* feeding on *leaves of cornus*, and the description of it published by him in v. 1, p. 100, CAN. ENT., does not at all agree with the larva of *pseudargiolus*. Mr. Mead has lately written me that the larvae of *neglecta* were found by him last year at Ithaca, N. Y., on flowers of *Ceanothus Americanus*—New Jersey Tea—but he does not appear to have written a description of them. We may hope that the coming season will settle the question of relationship in these cases. It may be inferred, inasmuch as *lucia* also is an early spring form (or, at least, I cannot learn that it appears at any other time than in late spring or early summer, which would correspond in New York to April and May here) that it is the spring form of the northern *neglecta*, which appears in the Catskills in June and at intervals till September.

I have a full series of drawings by Miss Peart, of the egg, several stages of the larva, and the chrysalis of *pseudargiolus*, and when I have obtained a like series of *neglecta*, I will devote a plate to them in the Butterflies of N. A.

As the plants on which the larvae were found here bloom only in the fall, the larvae of *violacea* and of the earlier broods of *pseudargiolus*, if they feed only upon flowers, must live upon a variety of plants.

NOTE.—After the foregoing lines were in type, Mr. Scudder wrote me that in Mass. "*neglecta*, *lucia* and *violacea* all appear in May," the inference being that one could not be the parent of another. I cannot but think that there is a mistake here, although Mr. Scudder's accuracy is well known. At Newburgh, N. Y., I always counted on taking *lucia* on the catkins of certain species of willow, and this was in May. But I have no mention in my diary of ever seeing *neglecta* before June. I wish that collectors interested in the subject would observe the times of first appearance of each of these species this season, and favor me with their observations through the ENTOMOLOGIST.

[Our own experience is rather adverse to the theory advanced by our esteemed friend Edwards, as to the identity of *neglecta* and *lucia*. We have never taken a single specimen of *lucia* in this neighborhood (Lon-

don, Ont.,) and do not know of any one who has, and we question if any district of our province has been more thoroughly worked up. *Neglecta*, although not very common, is taken every season here, the first brood usually occurring during the latter part of May and the early days of June, and the second brood in July and later. On looking over some old memoranda, we find the following dates of captures of *neglecta:* 1861, one specimen taken May 22nd, one on the 25th, one on the 30th, and one on the 4th of June. In 1862, two specimens on the 14th and one on the 15th of May. In 1863, two on the 19th and one on the 22nd of May, and in 1865, one on the 30th of May, one on the 4th of June, and a specimen much beaten on the 25th of the same month. On the 2nd of July a fresh looking specimen was taken, and on the 5th another, both probably belonging to the second brood. The larvae of *neglecta*, described in the paper referred to by Mr. Edwards, were taken nearly full grown on the 12th of July, feeding on a species of *cornus* (they were subsequently fed on willow); five of them produced the imago shortly after, and they were all well defined specimens of *neglecta*.—Ed. C. E.]

ON THREE NEW SPECIES OF NOCTUIDÆ.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

Agrotis rufipennis. N. sp.

♂. Eyes naked, all the tibiae spinose, antennae brush-like. Thorax, head and appendages brownish red. Anterior wings brownish red, silky. Median lines faint, blackish, tolerably approximate. T. a. line nearly straight, t. p. line evenly rounded, tending to be obsolete on the veins; costal dots mark the inception of the lines. Median shade very faint. Stigmata obsolete; there is merely an indication of the reniform. Subterminal line pale, narrow, continuous; terminal space darker than the wing, the fringes lighter. Hind wings pure white, immaculate. Abdomen pale. Beneath primaries powdered with reddish, secondaries white with powdery reddish scales along costal region. No perceivable lines or dots in the type. *Expanse* 38 m. m. *Hab.* New York (Lintner). The insect looks something like a *Ceramica*.

Orthosia helva. N. sp.

♂, ♀. A large and common species from the Eastern slope, of which I have seen many specimens. It is possibly not described here for the first time, but I can find no name for it. The eyes are naked, with lashes; tibiae unarmed; abdomen conical. The size is large, Hadena-like. Fore wings dark yellow, with the lines reddish brown, obsoletely and widely geminate, distinct; t. a. waved, inner line incomplete. Orbicular concolorous, brown ringed, sub-ovate; reniform large, illy defined with a prominent inferior blackish stain; median shade well marked, nervulous. T. p. line with the inner line fine, dentate, the outer line continued as a series of black nervular points. Subterminal line broken, with a darker costal preceding shade. Fringes darker than the wing, cut with pale. Hind wings fuscous, with yellow fringes. Abdomen mostly dark yellow, with plumose side and anal tufts in the ♂, and with a feeble basal tuft. *Expanse* 40 m. m.

I refer this species to *Orthosia* rather than *Hadena*, from the lashed eyes. It is larger than, but resembles *O. ferrugineoides.*

Glæa venustula. N. sp.

A species distinguishable by the nervules, vein 1, and the median vein being finely and continuously marked with pale. The color is a light drab brown, costal and internal edges of the primaries and the edges of the collar pale. Transverse lines pale; t. a. line rounded with a dark succeeding shade. Stigmata concolorous, distinctly pale ringed; orbicular oblique, irregular, narrowed; reniform somewhat pyriform, narrowing inferiorly; s. t. line of the usual shape, pale, with preceding dark shade, distinct. Terminal line black, incomplete; fringes concolorous. Hind wings blackish fuscous, with ruddy fringes. Beneath pale reddish, fuscous on the disc of primaries; hind wings feebly irrorate, with a line and discal spot. *Expanse* 42 m. m. *Hab.* Maryland (Lintner).

The genera *Orthosia* and *Glæa (=Cerastis)* are regarded as nearly allied by Lederer and Herrich-Schaeffer. My *Glæa apiata* is cited as "*Orthosia ! apiata*" by Mr. Morrison (this vol., p. 16); the exclamation mark is superfluous, as I had already correctly referred the moth, and the latest work of an author, replacing a former one, is the one to be criticized. Mr. Morrison says of the species of *Glæa*, that the claviform spot "seems to be nearly always (?) present in this genus, although not mentioned in Mr. Grote's descriptions." As constituted by myself (Bul.

B. S. N. S., 2, 125), the genus in America is composed of *viatica* Grote, *decliva* Grote, *inulta* Grote, *apiata* Grote, and *olivata* Harvey. In none of the specimens of these species before me is there the faintest trace of the claviform. I do not know Mr. Morrison's new species, *sericea* and *pastillicans*. There is no trace of the spot in the more recently described *tremula* Harvey, from Texas. The tendency, however, throughout the Noctuidæ is to reproduce the normal ornamentation, and it is possible that certain specimens may show traces of a spot usually absent in the species to which they belong. Such cases authorize no stricture upon original descriptions of species based on specimens which do not exhibit the character.

ON SOME OF OUR COMMON INSECTS.

THE BEAUTIFUL DEIOPEIA—Deiopeia bella.

BY THE EDITOR.

This lovely moth, represented in fig. 11 (after Riley) may well claim a place among the most elegant and beautiful of the Lepidoptera. Although rare in some parts of our province, they are quite common in other localities. We have found them common in the neighborhood of Port Stanley, on the shores of Lake Erie, and they are usually common and sometimes abundant about Grimsby, Ont. We have also seen them in other collections from various parts of Canada.

Fig. 11.

This moth measures when its wings are expanded about one and a half inches. Its fore wings vary in color from lemon yellow to orange, and are crossed by six white bands, each containing a row of black dots. The hind wings vary in color from pink to scarlet red, with an irregular border of black behind. The fringes of the wings are white.

The under surface of both pairs of wings is of a deep red color, with the front edge of the fore wings yellowish; the white bands on the upper

surface of the fore wings are not reproduced, but the black dots are more prominent, and being more or less confluent, appear as broken bands. The hind wings are marked nearly as above.

The head is white, spotted with black ; the shoulder covers white, with some yellow at the base, and two black dots on each ; the thorax and abdomen whitish, the former with six black dots, the latter banded with black beneath.

LIST OF DIURNAL LEPIDOPTERA OF THE ISLAND OF MONTREAL, P. Q.

BY F. B. CAULFIELD, MONTREAL, P. Q.

PAPILIONIDÆ.

1. Papilio asterias Drury.

Not common in the vicinity of the city ; more abundant in the open country. May to end of August.

2. Papilio turnus Linn.

Generally common ; end of May to middle of July.

PIERIDÆ.

3. Pieris oleracea Harris.

Not common ; May and June. I have not seen an August brood.

4. Pieris rapæ Linn.

Very common, although not so extremely abundant as a few years ago, owing to the attacks of *Pteromalus puparum*. May to end of September. Var. novanglia Scudd., not common, but appears throughout the season.

5. Colias eurytheme Boisd.

Very rare ; a male in fine condition taken last season (1874) by Mr. C. W. Pearson.

6. Colias philodice Godart.

Generally abundant ; last season very scarce ; June to October ; white females very rare ; August.

DANAIDÆ.

7. Danais archippus Cram.
Generally common ; some years very scarce ; May to end of Sept.

NYMPHALIDÆ.

8. Argynnis cybele Fabr.
Common ; end of June to middle of August.

9. Argynnis aphrodite Fabr.
Not so common as last species ; end of June to middle of August.

10. Argynnis atlantis Edwards.
Very rare ; I took one example in 1872.

11. Argynnis myrina Cram.
Very common in damp meadows ; May, June and August.

12. Melitea phaeton Drury.
Rare ; June.

13. Phyciodes Harrisii Scud.
Very rare ; taken by Mr. P. Knetzing.

14. Phyciodes nycteis Doubld.
Rare ; July.

15. Phyciodes tharos Boisd. & Lec.
Very common ; June to middle of August.

16. Grapta interrogationis Fabr.
Rare ; May (hybernated) ; July to October.

17. Grapta comma Harris.
Common ; May (hybernated) end of June to October ; var. dryas Edwards not so common.

18. Grapta faunus Edwards.
Generally scarce ; last season (1874) very abundant. May (hybernated) July to October.

19. Grapta progne Cram.
Common ; May (hybernated) July to October.

20. Vanessa antiopa Linn.

Very common; end of April and May (hybernated), July to October Var. Lintnerii, bred by Mr. Pearson last season.

21. Vanessa milberti Godart.

Not common, being greatly checked by parasites in this locality. I collected over thirty larvæ last season (1874), but only got four butterflies, the remainder being full of small ichneumons. May (hybernated) August and September.

22. Vanessa J-Album Boisd. & Lec.

Not common; end of April and May (hybernated) July to October.

23. Pyrameis huntera Drury.

Generally scarce; August and September. I have not seen hybernated specimens.

24. Pyrameis cardui Linn.

Some years scarce, others common; very abundant last season (1874.) May and June (hybernated) August and September.

25. Pyrameis atalanta Linn.

Not common; May (hybernated) end of July to October.

26. Limenitis arthemis Drury.

Not abundant; July and beginning of August.

27. Limenitis disippus Godart.

Common; June to end of August.

SATYRIDAE.

28. Euptychia eurytus Fabr.

Common in open woods; June.

29. Satyrus nephele Kirby.

Not common; open fields; July and August.

30. Lethe portlandia Fabr.

Not common; July.

31. Pararge Boisduvallii Harris.

Abundant in open grassy swamps; end of June to middle of August.

LYCAENIDAE.

32. Thecla calanus Hübn.

Generally rare ; abundant last season (1874) on blossoms of Asclepias and Sumac ; July and August.

33. Thecla mopsus Hübn.

Rare ; July and August.

34. Thecla niphon Hübn.

Very rare ; taken by Mr. P. Knetzing.

35. Chrysophanus Americana Harris.

Generally common ; May, June, August and September.

36. Chrysophanus hyllus Cram.

Thoe Boisd. ; very rare. I took three specimens at Lachine in Aug., 1872, and have not met with it since.

37. Lycaena comyntas Godart.

Rare ; June, July and August.

38. Lycaena lucia Kirby.

Very common ; May and June.

HESPERIDAE.

39. Epargyreus tityrus Fabr.

Common ; June and July.

40. Thorybes pylades Scudder.

Bathyllus Harris ; common ; end of May, June and July.

41. Nisoniades brizo Boisd.

Rare ; June.

42. Atrytone hobomok Harris.

Very common ; June. *Pocahontas* ♀ var. Scudder not common.

43. Anthomaster Leonardus Harris.

Very rare ; one specimen taken in 1872.

44. Polites peckius Kirby.

Wamsutta Harris ; not common ; July.

45. Hedone orono Scudder.

Not common; July.

46. Limochores mystic Scudder.

Not common; July.

47. Limochores taumas Fabr.

Ahaton Harris; Very common; end of June and July.

These are all the species that I have seen from this locality *Pieris protodice* was taken at Lachine some years ago by Dr. Barnston. *Argynnis bellona* was taken last season (1874) by Mr. R. Jack, on the south shore of the St. Lawrence, opposite Lachine, and probably will yet be found on the Island of Montreal, and I think additions will be made to the Lycænidæ and Hesperidæ when these groups have been properly worked up.

I have, with two or three exceptions, followed Mr. W. H. Edwards's synopsis in this list, both in classification and nomenclature.

I hope to soon give lists of the remaining families, and would here gratefully acknowledge the assistance given me by those friends who kindly allowed me to study and refer to their material, amongst whom I would especially mention Messrs. Wm. Couper, P. Knetzing, C. W. and G. B. Pearson.

DESCRIPTION OF A NEW NORTH AMERICAN SPECIES OF MAMESTRA, AND OF A GENUS ALLIED TO HOMOHADENA.

BY H. K. MORRISON, CAMBRIDGE, MASS.

Mamestra dodgei. Nov. sp.

Expanse 34 m. m. Length of body 14 m. m. Eyes hairy; antennae of the male simple; villosity of the palpi coarse; thorax provided with the usual fore and hind tufts; abdomen short, stout and untufted; ground color of the anterior wings gray, without ochreous or brown admixture, as in *M. lorea* Guen.; the ordinary spots are tolerably distinct, concolorous, black encircled, the reniform filled below with black, the claviform small; the median lines are simple, black and conspicuous, the interior line perpendicular, forming a triangular projection above the orbicular spot,

which it touches; below it is lobate; the exterior line is even and non-denticulate; it is incepted at about the middle of the costa, strongly produced around the reniform spot, and below it extends obliquely, reaching the inner margin very close to the interior line; the median shade is indistinctly seen below the reniform spot; the subterminal line is diffuse and undulate; a black line at the base of the dark fringe.

Posterior wings blackish, with a light fringe; traces of the discal dots and median lines.

Beneath the wings are yellowish gray, with a very distinct undulate common median line; discal dots small; the base and median portions of the anterior wings blackish.

Hab. Nebraska (G. M. Dodge.)

This species is closely allied to our common *M. lorea*, which also occurs in Nebraska; the differences will be readily seen from the description.

I dedicate this insect to my friend Mr. G. M. Dodge, already well known by his interesting contributions to this magazine.

Copihadena. Nov. genus.

Under this name I separate from allied genera a little Texan species which has just been described by Dr. Harvey, of Buffalo, as *Homohadena atricollaris*. The species cannot be referred to *Homohadena* on account of the slender claw at the extremity of the anterior tibia, and which seems to have been overlooked at the time of description. This new genus is quite remote from the few other genera of Noctuidæ which possess the above important structure, as *Dicopis*, *Copipanolis* and *Adita*; it is perhaps nearest to *Oncocnemis*, but the eyes have not distinct hairy lashes and the ornamentation is entirely different. It differs from *Homohadena*, besides the tibial claw, by the slender thorax and elongate wings; however, the ornamentation is very similar in the two genera. *Homohadena induta* Harvey, described at the same time as *H. atricollaris*, is identical with *Homohadena retroversa* Morr., from Missouri. Many of the species which are found in Missouri, Kansas and Nebraska also extend down into Texas.

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 75.)

ŒCOPHORA.

Œ. basquecella.

Palpi dark brown, with a yellowish white annulus around the middle and tip of the second and third joints. Head yellowish white; antennæ dark brown, with the extreme tip of the basal joint white. Thorax above and base of the forewings brown; dorsal margin of the forewings, from the base to the ciliae, pale orange yellow, with a broad fascia of the same hue at about the basal fourth, passing across the wing and gradually narrowing to the costa. Behind this fascia to the apex the wing is brown, containing an irregular yellowish spot at about the middle of the costal margin, and a white one immediately before the ciliae. The brown color has a rich maroon tint, and not a dead lustreless hue. Legs and tarsi brown, annulate with pale yellowish. Venter brown, with two yellowish bands before the apex. *Al. ex.* ½ inch. Basque Co.

GRACILARIA.

G. belfrageella. N. sp.

Antennae purple brown; face and palpi white, the second joint of the maxillary palpi being tipped beneath its apex with purple brown; thorax and wings purple brown. The costal triangle is pale lemon yellow (nearly white), reaches the fold, where it is truncated, and it extends as a wide band along the costal margin to the ciliae. Sides of the thorax purple brown; anterior and middle legs purple brown, with white tarsi; hind legs whitish, except the apical halves of the femora, which are purple brown. *Al. ex.* $\frac{7}{16}$ inch.

THEISOA.

It is possible that this genus ought not to have been separated from *Elachista.* Its more elongate palpi, the horizontal position in repose of the wings, and the dissimilarity of ornamentation of the wing from that of other species of *Elachista*, induced me to separate *T. bifasciella* from

that genus, and make it the type of this. *Bifasciella* is not a very appropriate name for that species, since it is seldom that the second fascia can properly be called a fascia at all; usually it is only indicated by a slightly paler shade of the yellowish brown color of that part of the wing between the small white costal and dorsal streaks at the beginning of the ciliae, and sometimes these streaks are not at all distinct. The specimens from Texas do not differ from those taken in Kentucky. The species described below does not differ structurally from *T. bifasciella*, but its ornamentation is very different both from it and from all species of *Elachista* known to me, whilst it is almost exactly that of a species described by me in the *Cincinnatti Quar. Jour. Science, v. 2*, under the specific name of *fasciella*, as the type of a new genus, *Æsyle*. *A. fasciella*, however, is structurally quite distinct from *Theisoa*, and approaches much more closely to *Lithocolletis*, from which I separate it with hesitation.

T. multifasciella. N. sp.

Head brownish yellow, becoming paler on the face around the mouth. Palpi externally brown, internal surface white. Antennae alternately brown and silvery white. Upper surface of the thorax and base of the forewings brownish red. The forewings are banded with alternate wide fasciae of white and brownish red, the brownish red fasciæ being margined rather narrowly behind with dark brown. Including the brownish red on the base of the wings, there are four fasciæ of that hue and three white ones and the tip of the wing is also white. Hind wings and ciliae of the forewings pale grayish fuscous. Abdomen brown, the tip and posterior margin of each segment being white. Under surface of the forewings dull brown, that of the hind wings shining grayish fuscous. Legs and tarsi with alternate annulations of white and shining dark brown. *Al. ex.* $\frac{5}{16}$ inch.

ELACHISTA.

E. inornatella. N. sp.

Dark brown, immaculate, in some lights showing a faint purplish gloss. *Al. ex.* ¼ inch.

ITHOME, *gen. nov.*

This genus is allied to *Elachista*, *Chrysoclista*, *Laverna*, *Chauliodus* and *Perimede*.

The palpi are long, slender and (in the dead insect) drooping and slightly divergent, resembling those of *Chrysoclista*, but more slender and the joints more nearly of the same size ; the third joint is longer than the second. Tongue moderate, scaled. Face full, convex, nearly as wide as long ; head and face smooth, with scales appressed ; eyes globose, of medium size ; antennae about two-thirds as long as the wings, with the basal joint a little elongate.

Fore wings lanceolate ; the costal vein reaches the margin before the middle ; the cell is acutely closed ; the subcostal vein sends three branches to the costal margin, the first being emitted just behind the middle, and the third at the end of the cell, and the second nearer to the third than to the first ; the median vein divides into three branches, the first of which is opposite to the second subcostal, and the third is at the end of the cell, and between it and the third subcostal branch is a discal ? branch which is furcate before the apex, with a branch to each margin near the apex ; the submedian vein is furcate at the base, and reaches the dorsal margin opposite to the first branch of the median.

Hind wings almost linear ; costal vein very short ; subcostal straight to the apex ; cell unclosed ; the median divides into three equidistant branches, the second of which attains the dorsal margin about the middle, and there is an independent ? discal branch, which arises at the median and goes to the dorsal margin.

I. unimaculella. N. sp.

Palpi white on the upper surface, dark brown beneath, and with about three microscopic whitish specks on the under side of the third joint ; tongue and face silvery white ; antennae, vertex, thorax and forewings dark purplish brown ; there is a small yellowish costal spot immediately before the ciliae, but the forewings are otherwise immaculate. Anterior and middle legs and tarsi brown, the tarsi annulate with whitish ; hind legs and under surface of the body yellowish silvery. *Al. ex.* ¼ inch.

At a hasty glance this species and *Eriphia concolorella* and *Elachista concolorella* may be mistaken for each other. But the more elongate palpi, narrower wings, finer scales and costal spot, as well as the white upper surface of the palpi, sufficiently distinguish this species. The other two species differ very slightly in shade of color, but may be distinguished by the structure of the palpi, those of *Eriphia concolorella* being more elongate than those of the *Elachista*. All three are obscure, plain species.

COLEOPHORA.

C. albacostella. N. sp.

Second joint of the palpi with a minute projecting tuft beneath its apex. Basal joint of the antennæ a little swollen. The head is tinged with ochreous, as also are the wings, though more faintly so ; the wings are somewhat dusted with fuscous, especially towards the apex. Extreme costa from the base to the ciliae white. *Al. ex.* a little over ½ inch.

C. trilineella. N. sp.

Antennae and palpi simple ; upper surface of the thorax white, the lower surface and legs tinged with yellow. Fore wings white, with a pale golden or ochreous line beneath the fold, close to and parallel with it ; a darker, but not more distinct line, parallel to the costa and close to it ; a more distinct ochreous line extends from the base to the apex, sending off in the apical part of the wing two branches to the costal ciliae. *Al. ex.* ½ inch.

OBITUARY.

[FROM THE AMERICAN JOURNAL OF NUMISMATICS, APRIL, 1875, VOL. IX, NO. 4, PAGE 95.]

" Mr. Philip L. Sprague, a resident member of the Boston Numismatic Society, died at Montpelier, Vt., his native place, on the sixth day of August last, in the forty-fifth year of his age. We have received from an intimate friend of his the following notice of our late member :—

" ' About 1862 he commenced the study of Entomology with me in the State Cabinet of Natural History, displaying a marked taste for the Lepidoptera, and during the intervals of his business made considerable progress in biological investigations, as well as in the technology of the science. Circumstances soon induced him to direct his attention chiefly to the Coleoptera, and here his assiduity in making collections, his accuracy in the determination of species, and his studies in the microscopic anatomy of this order, gave his opinions weight among naturalists. His keen appreciation of the labors of his predecessors, and his love of neatness and method evinced themselves in all he did.

" 'At the time of his death he had been for some months a valuable assistant and member of the Boston Society of Natural History, where many of his works remain to speak for themselves. Among his associates there he was distinguished for his geniality of manner and never-failing readiness to assist younger students. At the time of his death his fame and foreign correspondence were somewhat extended, and he was actively engaged in the preparation of materials for an illustrative cabinet of the Natural History of his native State. He had published from time to time in the CANADIAN ENTOMOLOGIST and the Proceedings of the Natural History Society carefully elaborated results of his work, and contributed to various other periodicals devoted to his favorite branch of investigation. His fine private cabinet of insects, principally of the Coleopterous Order, in accordance with his expressed determination, form a part of the Museum of the Society to which he was attached, and is in itself no mean monument to his memory.' F. G. S.

" Mr. Sprague was elected a member of this Society May 5th, 1860."

CORRESPONDENCE.

RHAGIUM LINEATUM.

DEAR SIR,—

In reply to Mr. W. V. Andrews' enquiry, I would say that the above insect breeds under the bark of pine stumps. I have good reasons for thinking that it completes its transformations in September and hybernates until tbe following spring. I had long expected such to be the case from finding it in February and March, both living and dead, in the cavity formed by the larva in which to pupate. But in September, 1874, I found numerous specimens of the beetle that had just appeared, many of them not mature in color, and with them several specimens of the pupæ.

H. L. MOODY, Malden, Mass.

DEAR SIR,—

Mr. Andrews inquires, page 80, about *Rhagium lineatum* Oliv. The habits of this common species are well known to collectors of Coleoptera. Harris says, Ins. Inj. to Veg., p. 116: " These grubs (larvæ of *Rhagium*) live between the bark and the wood (of pines) often in great numbers together, and when they are about to become pupæ, each one surrounds itself with an oval ring of woody fibres, within which it undergoes its

transformation. The beetle is mature before winter, but does not leave the tree until spring." I can personally vouch for the accuracy of the above, having often uncovered the beetle both in the fall and winter, as well as in the spring. It is ready to fly upon the advent of warm weather, and there were unquestionably other individuals about besides those observed on the church walls. This species, curious in other respects, furnishes also in its habits of hybernating a rather remarkable exception to the general rule among the Cerambycidæ. Most species of this family in this latitude pass the winter in the larval stage. During many successive winters' collecting I have met with no other species in its mature form. Several years since a living specimen of *Microclytus gazellula* Hald. was dug out of the bark of a living white oak, quite late in October, where it would doubtless have passed the winter months. Mr. E. P. Austin tells me, in a letter written at the time, of finding a specimen of *Graphisurus pusillus* Kirby, I think it proved to be, while sifting leaves in the winter of '73—'74. The only other instance which I now remember of the occurrence of a Cerambycide in winter is given by H. F. Fay, of Columbus, Ohio, in the Proc. Ent. Soc. of Phil., 1, p. 198, in an article on "Winter Collecting." He says: "The only Longicorn I have met with is a single specimen of *Cyrtophorus niger* Lec., or a var. of *Clytus albofasciatus* Grey."——"It was found"——"in the soft wood of a decaying elm."

F. PLANCHARD, Lowell, Mass.

DEAR SIR,—

In answer to Mr. Andrews' enquiry about *Rhagium lineatum*, in CAN. ENT., No. 4, I will say that I have found thousands under the bark of pine logs during the fall and at various times until the early summer months. The larva, pupa and imago are frequently found all at one time and under the bark of the same log, and I have at this time a bottle of specimens gathered in November from under the bark of a Jersey pine log not twenty miles from Mr. Andrews' residence.

A. S. FULLER, Ridgewood, Bergen Co., N. J.

ON THE USE OF CYANIDE OF POTASSIUM.

We have been favored with a letter from Mr. J. E. Chase, of Holyoke, Mass., in reference to the use of bottles containing Cyanide of Potassium for catching and killing moths. Mr. C. encloses a specimen label such as

he attaches to bottles and distributes among those of his friends who are disposed to help him in making captures. We append this for the benefit of our readers:

POISON.

Directions How to Catch Moths, etc.—The contents of the bottles are prepared by dissolving Cyanide of Potassium in water, and pouring into the bottle to the depth of half an inch; then drop in Plaster Paris until it thickens, and let it stand until hardened, keeping it corked. To catch moths with it, the best way is to take sugar from a molasses hogshead and mix with water, making it thick; spread this mixture on old posts, or trunks of trees, fences, &c., for two or three days. When the moths begin to scent the sugar, provide yourself with a small lantern giving light only on one side; visit each post and tree, and you will find moths by letting the light shine on the sweetened places. Then hold the bottle under one of them, and it will dart or fall into it; cork immediately or it will fly out. Then put the bottle in your pocket, and use another bottle to catch the next one, and by that time the first bottle will be ready for use again. You can thus visit each post, and when you reach the last one it is better to put the moths into a box, so that the new ones will not spoil them by flying among them. Some persons dip old rags into the syrup and hang them up to attract the moths.

Dear Sir,—

From a friend in the neighborhood of Salt Lake, Utah Territory, I received a small lot of Lepidoptera, and as collectors would no doubt be pleased to learn something of the fauna of that locality, I will give you a list of the insects received, viz:

Papilio daunas Boisd,
Pieris protodice Boisd. & Lec.,
Anthocaris ausonides Boisd.,
Colias eurytheme Boisd.,
Vanessa antiopa Linn.,
Pyrameis caryae Hübn.,
Lycaena anna,
Chrysophanus helloides Boisd.
Gnophaela vermiculata,
Deilephila lineata,
Platysamia gloverii Strecker,
Arctia americana,
Catocala faustina? Strecker,
Erebus odora,

Of Platysamia gloverii I received two examples, both males, and as there were none of P. cecropia among the lot, I would take it to be a proof that gloverii is not a form of that species. Besides the differences

between the two species are too marked to leave any doubt of their being distinct. Mr. Hermann Strecker informs me that he has never heard of P. cecropia being taken west of the Mississippi River. The example of Anthocharis ausonides differs somewhat from my specimen of that species from California, and resembles more the European Anthocharis belia.

Edw. L. Graef, Brooklyn, N. Y.

Dear Sir,—

In reply to the synonyms selected by Mr. Morrison (on page 79 of this volume), from my frequent papers during the last thirteen years, I wish to state that *Orthosia ferrugineoides* Grote ex. Guen. is a different species from *Orthosia ralla* Grote ex. G. & R.: the latter differs by the pellucid yellowish hind wings, not clouded with fuscous, and the black dots of the subterminal line, among other characters. *Plusia ou* is twice the size of *P. fratella*, and I have seen no intermediate specimens. It is not right to express oneself in such a manner, that my synonyms in the Noctuidae, occurring from time to time during the description of over four hundred new species (in the face of the difficulties imposed upon students by the works of Gueneé and Walker) over a long period of time, appear to be charged as committed within six months. Of the six synonyms I am charged with, one is an error of Mr. Morrison's, and only two were published in 1874; the remaining three species were published and *figured* by me in 1863, 1864 and 1870 respectively. I also have shown *Tricopis* and *Euleucyptera* to be distinct, and I take issue with Mr. Morrison as to the validity of *Bolina nigrescens* as distinct from *fasciolaris*, and on the authority of my catalogue names.

Mr. Morrison remarks (p. 79) that "in ignoring (?) Mr. Grote's genera *Eucoptocnemis*, *Exyra* and others (?) I simply follow the example of Dr. Speyer," etc. Now, the fact is, that on the only occasion which Dr. Speyer has yet had to refer to one of these genera of mine, it is *adopted*, not *ignored* (vide *Leucobrephos* Speyer, Stett. Ent. Zeit., 1875, 175). There are, however, only *three* such names in my whole List, viz., *Conservula*, *Exyra* and *Leucobrephos*. The diagnosis of *Tricholita* is given by Mr. Morrison under the term "*Perigrapha*," which applies to a different form; *Eucoptocnemis* is distinctly and properly founded on structural characters given by Gueneé to the single species: *fimbriaris*. The other generic names of mine without diagnosis in the "List" replace, for one sufficient reason or another, a name previously used.

I do not consider it an adequate reply to my criticisms of Mr. Morrison's publications, or to my complaints as to some misrepresentaions of my writings by Mr. Morrison, that certain synonyms of mine (corrected previously by myself) are brought up and offered as an answer to the one and as an apology for the other. My original remarks remain rather in full force, with the one exception where they refer to *Agrotis exsertistigma*, for which latter I am sorry and have excused myself on the ground of Mr. Morrison's retention of my material. In reply to Mr. Morrison's justification of *Eutricopis*, there appears no character but the unarmed tibiae to distinguish it from other Heliothid genera in Mr. Morrison's diagnosis, and it is there expressly stated to differ by the "unarmed tibiae." Now the term implies that it is "beautifully armed," and hence is inappropriate. With regard to Mr. Morrison's insinuations as to missing species in my "List," it is the great good fortune of this "List" that it is incomplete and thus awaits changes at Mr. Morrison's hands. My List must be judged, however, by its predecessors in the same field, and not by information acquired subsequent to its issuance. I wish to draw, once for all, attention to the fact, that the most of Mr. Morrison's corrections in the shape of criticisms are *ex post facto*. Mistakes corrected by myself, determinations made by me when in England and France, are taken as part of our common stock of knowledge by Mr. Morrison, and used on occasion against me. I reply also finally to Mr. Morrison's charge as to his redescription of *lilacina*, that the author of a description, and not the authority consulted on the subject, is the one accountable for publication, while I am sorry that in certain of the successful ventures of Mr. Morrison, where my responsibility is equal, I am neither mentioned nor my courtesy acknowledged. A. R. GROTE.

[Having now given both of our correspondents a fair hearing, our limited space will oblige us to refrain from publishing anything further on this subject.—ED. C. E.]

DEAR SIR,—

I have recently united *Agrotis scandens* and *muraenula* in opposition to my previously expressed opinion (Trans. Am. Ent. Soc., 1873, 431), that they were distinct. Mr. Lintner now calls my attention to the fact and gives me good reasons for adhering to my previous opinion that the species are distinct. It appears that the specimens in the Buffalo Society's collection do in fact belong to one species, but I am wrong in referring both names to them. A. R. GROTE.

The Canadian Entomologist.

VOL. VII. LONDON, ONT., JUNE, 1875. No. 6

PRELIMINARY LIST OF THE NOCTUIDÆ OF CALIFORNIA.

Part VI.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

55. Agrotis exsertistigma Morrison (see ante p. 26). Sauzalito, Mr. Behrens, Oct., Nos. 16 and 209.

I sent specimens of this species to Mr. Morrison, keeping no memorandum or duplicates. Afterwards I supposed, from his brief comparison, that Mr. Morrison had described Californian specimens which I had considered as *alternata* Grote, under the new name. Subsequently Mr. Morrison returns me my specimen of *exsertistigma*, and I see that it is a distinct species which should not have been compared with *alternata*, as it is structurally different by the conical abdomen; the species should have been credited as received from me. That *redimacula* and *exsertistigma* are described by Mr. Morrison without any mention being made of the fact that I supplied the material either in part (*redimacula*) or wholly (*exsertistigma*), is a breach of etiquette. Mr. Morrison should not have hesitated to acknowledge so slight an indebtedness. *Agrotis alternata* does not appear to occur in California.

28. Agrotis cupidissima Grote (see ante pp. 214 and 27.)

Mendocino, June, Mr. Behrens, No. 4 (red label); also No. 164. The Californian specimens are light red colored, with powdery geminate lines, and variable in appearance; one is pale fawn, unicolorous, without marks on primaries save indications of the stigmata and the dotted t. p. line. Again, three specimens have the orbicular somewhat V-shaped, open above. The t. p. line is more regular than in *cupida;* it is accompanied by black dots. The subterminal line is nearer the margin than in either

alternata or *cupida*, but it is more like *alternata* than it is *cupida* in its being irregular, accompanied with powdery black scales; it is preceded on costa by a blackish shade as in *cupida*. The present species I have formerly considered as *alternata* from the markings, and, on Mr. Morrison's authority as *cupida* fiom the color, but the reniform I now see is more kidney shaped than in either the Eastern *alternata* or *cupida*. I sent a specimen to Mr. Morrison to show the variability of what I supposed was his *exsertistigma*, and he informed me that the specimen was *cupida*. *Afterwards* he returned me my specimen of *exsertistigma*, recorded above, which I then saw was an entirely different species. I have subsequently adopted the view that the Californian specimens were *cupida*, and that I was in error in considering them to be *alternata*. I now reject both determinations, and consider that the Californian species is allied to both *alternata* and *cupida* and is a new species from the data given above. The habitus of *cupidissima* and size (39 m. m.) is rather that of *alternata*. The hind wings are a little paler at base in *cupidissima*, and the lunule more obvious. *A. cupida* does not as yet appear to occur in California. The provisional identification on page 27 (ante) must be erased and the present substituted. I use the number (56) for a different species.

56. Agrotis obeliscoides Gueneé.

No. 30 (red label) Mr Behrens.

The Californian specimens are very near to *saxatilis* Grote, which latter I am now inclined to consider synonymous with Gueneé's species. They appear to differ chiefly by the more constricted reniform marked with white, the want of costal discoloration and the less brightly red hue. More material is needed to make this determination certain, together with a positive identification of *obeliscoides*.

123. Mamestra passa Morrison, Proc. Bost. Soc. N. H., 2874, 139.

Unknown to me and very possibly the same as *Dianthoecia pensilis* Grote.

124. Graphiphora carina (Morrison) l. c., 158 (*Taeniocampa.*)

"California." Unknown to me.

125. Agrotes inciris Gueneé, Morr. l. c., 164.

"California." Unknown to me from California. Mr. Morrison identifies my *Anicla Alabamæ* as this species too briefly described by Gueneé, who does not mention the dotted t. p. line.

126. Agrotis purpura Morrison, l. c., 164.

Unknown to me and too briefly described at present for identification.

127. Catocala Aholibah Strecker, Lep., pl. 9, fig. 5.

Sauzalitae, Aug. 27th, Mr. Behrens.

128. Catocala mariana Hy. Edwards, Streck., No. 11, 99.

"Vancouver." Unknown to me.

129. Catocala hippolita Hy. Edwards, l. c., 99.

"California." Unknown to me,

130. Catocala Cleopatra Hy. Edwards, l. c., 99.

"California." Unknown to me.

131. Catocala Perdita Hy. Edwards, l. c. 100.

"California." Unknown to me.

132. Catocala adultera Hinze, Motsch. Etudes Ent., 1857, 47 ; Grote, List 41.

"California." Unknown to me.

133. Catocala Californica Edwards, Proc. Ent. Soc. Phil., 2, 509.

California (in coll. Am. Ent. Soc.)

134. Catocala zoe Behr., Trans. Am. Ent. Soc., 3, 24.

"Searsville, Cal." Unknown to me.

135. Catocala Stretchii Behr., l. c., 24.

"Virginia City." Unknown to me.

136. Catocala irene Behr., l. c. 24.

"Fort Tejon." Unknown to me.

137. Erebus odora (Linn.)

California (Behr).

138. Agassizia urbicola Behr., l. c., 23.

San Francisco (Behr). Unknown to me.

139. Capnodes Californica Behr., l. c., 23.

"Downieville, Cal." Unknown to me.

140. Homoptera salicis Behr., l. c. 28.

Unknown to me.

141. Homoptera rosæ Behr., l. c., 28.

California, Mr. Hy. Edwards, No. 2487.

One specimen, smaller, but much resembling the Eastern *H. lunata.*

142. Pseudaglossa lubricalis (Geyer); Grote, List, 47.

California (Behrens).

143. Hypena Californica Behr., l. c., 23.

Oakland (Behrens).

144. Brephos Californicum Boisd., Ann. Soc. Ent. Belg., 12, 88.

"Se trouve au printemps dans les clairières des bois." Unknown to me.

145. Brephos melanis Boisd., l. c., 88.

"Habite les bois." Unknown to me. There is perhaps reason to surmise that neither species is correctly referred to this genus.

With the present paper I terminate the "Preliminary List," in the expectation of again taking up the subject with more material than that hitherto kindly placed at my disposal by Mr. James Behrens and Mr. Henry Edwards. In addition to the 145 species here cited, Dr. Behr has described a few species, too briefly for identification, in Mr. Strecker's publication. I regret that, while I was working on the subject, I should remain in ignorance as to the identity of Mr. Morrison's *passa* and *earina.* The former I think may be referable to *pensilis;* from the description I do not think the latter has come to my hands. In the 12th volume of the Annales de la Soeieté Belge, pp. 89—90, Dr. Boisduval enumerates 36 species of Californian Noctuidæ. They are in great part European species apparently incorrectly identified as Californian. With the exception of *Drasteria erecthea* and the two species of *Agrotis*, *jaculifera* and *saucia*, I think it very probable that the identifications are all incorrect.

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 95.)

PHÆTUSA, *gen nov.*

I define this new genus with great hesitation and doubt as to the propriety of so doing. The only reason for separating the species described below, and which I place in this genus, from *Evippe (vid. E. prunifoliella, ante v. 5, p. 185)* is found in the neuration. The other characters are those of *Evippe*, and, as stated below, it is very near to *E. prunifoliella* in ornamentation. The neuration of the forewings is exactly that of *Eidothea vagatioella (loc. cit. sup. p. 187)*, which it also resembles in ornamentation, but less closely than it does *Evippe prunifoliella*. In the latter species the last branch of the median vein of the fore wings is simple ; in *E. vagatioella* and the species described below it is furcate at its origin. In *E. prunifoliella* and *E. vagatioella* the cell of the hind wings is open ; in this species it is distinctly closed. In *vagatioella* the median gives off a single branch, and there is an independent discal branch which arises at the median ; in *prunifoliella* the median gives off two branches and has the discal branch vein as in *vagatioella ;* in this species it gives off the two branches, and has the discal branch as in *prunifoliella*, but in addition has another superior discal branch. Probably all three species should be included in the same genus, though *vagatioella* has the palpi longer than either of the others. In *prunifoliella* the second and third joints of the palpi are of about equal length ; in this species the third joint is a little longer than the second. In other respects the generic characters are the same. In all three the vertex is wider than long, and the face nearly as wide as long and very full or convex in front. All three form a section of *Gelechia*, and *Taygete difficilisella*, *Helice pallidochrella*, and *Sinoe fuscopalidella* are very closely allied to them structurally, though differing widely from them and resembling each other in ornamentation. *Neda plutella* also resembles this species in ornamentation, but the palpi are very different, and it differs widely in several respects.

The following remarks, in addition to what has heretofore been written on these allied species, may not be inappropriate in this connection, though they contain the results of examinations of the species before I saw the species described below.

Sinoe fuscopalidella has a tongue, as I find on examination of fresh specimens, but it is short and inconspicuous. Probably it would be as well to include it with *Taygete difficilisella* and *Helice pallidochrella*, and possibly also *Gelechia obliquistrigella* in a single genus. *Evippe prunifoliella* and *Eidothea vagatioella* must, however, be separated from these because of their slender, more elongate and graceful forms and longer palpi, though they do not otherwise differ from *Helice pallidochrella* and the other species above named more than those species differ from each other. *H. pallidochrella* and *T. difficilisella* resemble each other closely in ornamentation, but *G. obliquistrigella* and *S. fuscopalidella* even more closely. The last named species may, however, be distinguished as follows : *obliquistrigella* has the second joint of the palpi brown without and white within, whilst in *pallidochrella* it is decidedly suffused with rufous on the outer surface at and towards the tip. *Obliquistrigella* is a trifle larger than the other, has the central portion of the wings streaked more distinctly with black, and has no raised tufts on the fore wings. The description of *fusco-ochrella* should be amended to state that the face is "white, faintly iridescent."

My genus *Agnippe* seems by its position in repose to be allied to *Swammerdamia*, of which no species has yet been found in this country. It also resembles that genus somewhat in ornamentation, but *pallidochrella* and *obliquistrigella* resemble it in this respect more closely, though they do not in the position which they assume in repose. Many *Gelechia*, however, have the same pattern of coloration. *Evippe* and *Eidothea* have the same position in repose with *Agnippe*, but they differ widely in form. *Sinoe*, *Helice* and *Agnippe* resemble *Laverna* in having raised tufts of scales on their wings, but many species of *Gelechia* also have them. In all these new genera the form and neuration of the wings approach more nearly to *Parasia*, *Cleodora*, *&c.*

P. plutella. N. sp.

The species resembles *Evippe prunifoliella* so closely that I do not deem it necessary to describe it otherwise than by referring to the differences between them. *Prunifoliella* has a small white spot on the base of the costa of the fore wings, a distinct white costal spot just before the ciliae, and a white streak in the apex, all of which are absent in this species. In *prunifoliella* the white of the dorsal margin sends three large almost triangular projections into the brown ; in this species there are three scarcely perceptible emarginations only ; in *prunifoliella*, except the

silvery femora of the hind legs, the legs and tarsi are black, annulate at the joints with whitish; in this species the hind legs are yellowish silvery. *Prunifoliella* has an *alar ex.* of over 3/8 inch; this species is a little under 3/8. There are no raised tufts on any of my specimens, as there are in *E. prunifoliella*, and from the condition of the specimens it is scarcely probable that they could have been removed by attrition; it is possible, however, that there may have been some small ones, as it sometimes happens that small tufts on the wings are removed in setting or by rubbing, without leaving any marks by which their former presence could be detected.

PHIGALIA, *gen. nov.*

Palpi porrected, divergent, slender and simple, with the second joint nearly twice as long as the third, and a little clavate; no visible maxillary palpi. Head and face smooth, with scales appressed, the face nearly as wide as long, but little retreating; tongue small and scaled only at the base. Eyes full globose; basal joint of the antennae rather short and broad, with a few scales depending over the eyes (possibly the remains of a projecting tuft or of an eye-cap?); stalk simple, and about two-thirds as long as the forewings. The palpi and antennae remind one strongly of some species of *Coleophora*, but the face is too broad and the vertex too short.

The neuration and form of the fore wings is almost exactly that of *Perittia obscuropunctella*, as figured by Stainton, *Ins. Brit., v. 3*, the only difference being that the *Perittia* has the submedian vein furcate at the base, whilst in this species it is simple.

The neuration of the hind wings is also like that of *Perittia*, except that the fold is faintly visible; the wing is also a little narrower in the apical half. The wings are more coarsely scaled than in *Coleophora*, and the ciliae are shorter.

P. albella. N. sp.

Snowy white; under a lens a few scattered brown scales may be found in the apical part of the wing. *Al. ex.* 1/2 inch.

P. ochremaculella. N. sp.

I have not examined the neuration of this species, but the external characters are those of the preceding species, except that in this there is a distinct projecting tuft over the eyes.

White, the palpi dusted with pale ochreous. The forewings are marked with short and indistinct ochreous dashes, one of which is on the fold before the middle, another is placed about the middle beneath the fold, but touching it; there is another just behind the middle on the disc; one on the costal margin just before the middle, and another further back just within the costal margin. At or just behind the discal vein are two small, though distinct circular raised tufts of brownish scales placed transversely. The apex of the wing is suffused with ochreous. It is a little larger than the preceding species.

The Texas collections contain other species belonging to the *Gelechidæ*, of which descriptions will be hereafter given.

DESCRIPTION OF A NEW SPECIES OF DRYOCAMPA.

BY G. J. BOWLES, MONTREAL.

Dryocampa pallida.

Head, thorax, abdomen and wings above, of a creamy white, without any trace of bands or markings. Beneath, the body and wings are also creamy white, the costa of both fore and hind wings being near the base very faintly tinged with yellowish pink. The legs are also slightly pinkish. Antennae pale brown. Palpi and other parts of the mouth yellowish.

Described from a specimen I took at Quebec, and now in my cabinet. It is a male, body .70 in. in length, expanse of wings 1.90. Two other specimens of the moth are in the collection of the Abbé Provancher, Quebec.

This insect is closely related to *D. rubicunda;* so much so that it has been named a variety of that species by Mr. Grote, from specimens taken in Kansas by Professor Glover, and figured by the latter on his unpublished plates of Lepidoptera. I subjoin Mr. Grote's description, from the Bulletin of the Buf. Soc. of Nat. Sci., Vol. 2, No. 3.

"*D. rubicunda* Fab., var. *alba* Grote.

"Both sexes entirely of a creamy white, the wings and body having lost all yellow and rosy tintings. The feet remain pink, and the costae beneath at base are sometimes faintly suffused. Kansas."

It will be seen that the Kansas moth is identical with mine. I have no doubt but that the species is distinct from *rubicunda*. It is taken at Quebec, and is the only species of the sub-family Ceratocampadæ so far known to inhabit that locality. The distribution of this group, as given in Grote's "List" of the Platypterices and other sub-families of the Bombycidae (Nov., 1874) is interesting. All the species extend southward, some as far as Georgia, and some of them also spread into the more southerly parts of Canada. Only one *(rubicunda)* has heretofore been found in this Province, and that very sparingly. It has only been taken once, I believe, in the latitude of Montreal, and is unknown at Quebec. The new species is probably the most northern representative of the sub-family to which it belongs, and if the Kansas specimens come from the mountainous parts of that State, it would go far to support that supposition.

The early stages of the insect are as yet unknown, and it is rare in its occurrence at Quebec.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. v, p. 213.)

FAMILY CLERIDÆ

332. NECROBIA VIOLACEA *Linn.*—Length of body 2 1/3 lines. Taken abundantly on the journey.

[244.] Body dark blue, glossy, minutely punctured, rather hairy. Punctures on the head and prothorax nearly confluent and larger than those of the underside of the body; antennae black, last joint subquadrangular; sides of the prothorax obtusangular; scutellum black; longer punctures of the anterior half of the elytra arranged in rows, with the interstices minutely punctured; the rows then disappear, and the whole of the apex is indiscriminately and minutely punctured; legs black with a tint of brown.

[Taken in Canada.]

333. THANASIMUS ABDOMINALIS *Kirby*.—Plate ii, fig. 5.—Length of body 4½ lines. Several specimens taken in Lat. 65°.

Body black, hairy, with longish white and some black hairs. Head punctured with two posteriorly converging impressed lines between the eyes; palpi and antennae dull rufous, last joint of the labial palpi, which are more than twice the length of the maxillary, very large and semi-cordate; last joint of the antennae, which are shorter than the prothorax, ovate and subacuminate; eyes kidney [245] -shaped, rufous, with a golden lustre; prothorax thickly punctured, not wider and not much longer than the head, constricted behind, and anteriorly with a pair of oblique impressions, one on each side; elytra minutely punctured, with larger punctures arranged in five rows, the two exterior ones reaching from the shoulder to the middle, and the interior ones not so far; the elytra are traversed by a pair of white undulato-angular bands formed of decumbent hairs; the first begins at the base below the scutellum, and running down along the suture for a little way, then diverges and forms the band, which is broadest at the lateral margin; the other band is near the apex, broad, and projects anteriorly into an angle; the legs are dull rufous; the abdomen is between testaceous and orange, with the tips of the segments paler.

[Synonymous with *T. (Clerus) undulatus* Say. Kirby's name *abdominalis* being preoccupied, was changed by Klug to *nubilus*, who did not recognize the identity with Say's species. Is occasionally taken in Canada.]

FAMILY CYPHONIDÆ.

334. CYPHON FUSCICEPS *Kirby*.—Length of body 1¾ lines. A single specimen taken.

Body lurid, downy. Head brown, mouth lurid; antennae mutilated in the specimen, but what remains is brown; prothorax very short, transverse, slightly bisinuate both anteriorly and posteriorly; disk embrowned; elytra very minutely and thickly punctured; breast and belly brown; thighs embrowned.

[Is taken in Canada.]

FAMILY TELEPHORIDÆ.

335. TELEPHORUS ATER *Linn.*—Length of body 2¾ lines. A single specimen taken in the journey from New York to Cumberland-house.

[246.] Body black, rather hairy. Head suborbicular, obsoletely channelled; mouth, palpi, and base of the antennae, rufous; prothorax rather wider than long, very glossy; disk obsoletely channelled and a little elevated on each side the channel; anterior angles rounded; elytra minutely and confluently punctured, when elevated from the body they appear embrowned; tip of the thighs, tibiae, and tarsi, rufous.

336. Telephorus Westwoodii *Kirby*.—Length of body 5¼ lines. A single specimen taken in Lat. 65°.

Body black, downy. Head suborbicular, rufous with a black anteriorly tridentate band between the eyes: mandibles and palpi dusky at the tip; antennae shorter than the body, with the scape and the base of the pedicel or second joint, rufous; prothorax rufous, rather wider than long, anteriorly rounded, posteriorly transverse with the margin much reflexed; disk slightly channelled; elytra obsoletely punctured, or wrinkled, with three obsolete longitudinal elevated lines, the outer one abbreviated at both ends; legs dusky, base and apex of the four anterior thighs rufous; posterior thighs rufous, dusky at the tip.

337. Telephorus Samouellii *Kirby*.—Length of body 5¼ lines. Taken in the route from New York, in Lat. 65°, and in the Rocky Mountains.

Very like *T. Westwoodii*, but the antennae are dusky, pale at the base; between the eyes is a faint dusky cloud; the scutellum and the legs are testaceous, as are the sides and tips of the ventral segments of the abdomen as well as the anus.

[247] 338. Telephorus Curtisii *Kirby*.—Length of body 4¼ lines. Taken in Lat. 65°.

Very like the preceding species, but it is smaller; there is a black band between the eyes; the prothorax is considerably longer and narrower in proportion, the posterior angles are more acute, and the tarsi are black.

[Taken by Agassiz's Expedition to Lake Superior.]

339. Telephorus (Malthacus) Puncticollis *Kirby*.—Plate vii, fig. 4.—Length of body 2⅓ lines. A single specimen taken in Lat. 54°.

[248]. Body black, rather hairy, with short decumbent white hairs. Head rhomboidal, lightly and minutely punctured; posteriorly obsoletely

channelled; impressed between the eyes; pale-yellow below the antennæ: antennae longer than the prothorax, three first joints underneath of a dull-red, second and third, taken together, scarcely longer than the fourth; prothorax nearly square, lightly and very minutely punctured; anterior angles rounded, posterior rectangular; disk channelled, and on each side the channel longitudinally elevated; sides luteous; posterior margin reflexed; elytra very minutely and thickly punctured; lateral margin anteriorly rather pale; legs black; trochanters and cubits dull-rufous.

[Belongs to *Podabrus*.]

340. Telephorus (Malthacus) Lævicollis *Kirby*.—Length of body 3½ lines. A single specimen taken in the Rocky Mountains.

Body black, somewhat hoary with decumbent hairs. Head impunctured, impressed transversely between the eyes; mouth and three first joints of the antennae luteous; prothorax nearly square, very glossy, impunctured; elytra less visibly punctured than in the preceding species: legs luteous, thighs brown at the base.

[Taken by Agassiz's Expedition to Lake Superior. Belongs to *Podabrus*.]

341. Telephorus (Malthacus) Mandibularis *Kirby*.—Length of body 2¾ lines. Several specimens taken in Lat. 65°.

Body all black, except the red mandibles, somewhat hoary with decumbent hairs. Hind-head received by the prothorax; eyes very prominent; antennae longer than the prothorax; third joint nearly twice the length of the second; prothorax impunctured, scarcely wider than long, all the angles rounded; disk channelled, less elevated on each side; posterior lateral margins somewhat reflexed; elytra black, minutely and confluently punctured.

[Synonymous with *T. fraxini* Say. Taken in Canada; also by Agassiz's Expedition to Lake Superior.]

[249.] 342. Telephorus (Brachynotus) Bennetii *Kirby*.—Length of body 6 lines. Taken in Canada by Dr. Bigsby, and in Massachusetts by Mr. Drake.

Body black, hoary with decumbent hairs. Head suborbicular, punctured behind the antennae; neck rufous; front, before the antennae, pale yellow; exterior margin of the nose black; mandibles yellow at the base; antennae longer than the prothorax; prothorax pale yellow, disk

elevated with a black irregular punctured spot; elytra minutely and confluently punctured, somewhat dilated externally; obsoletely tricarinate; legs black; knees rufous.

[Synonymous with *Podabrus tricostatus* Say; a common species in Canada.

FAMILY LAMPYRIDÆ.

343. LAMPYRIS CORUSCA *Linn.*—Length of body 4¾ lines. Taken at New York and Cumberland-house, Lat. 54°. In Canada by Dr. Bigsby.

Body oblong, pubescent, brown-black. Nose and mouth elongated; prothorax nearly semicircular, disk elevated; a rose-coloured arched streak dilated and yellower anteriorly adjoins the elevated part on each side; elytra obsoletely carinated, most numerously and minutely punctured.

[Belongs to *Ellychnia* Lec. Very common in Canada.]

ON GENERA IN THE MOTHS.

BY A. R. GROTE, BUFFALO, N. Y.

Since I am recently criticized for erecting new genera in the Sphingidæ, as it is thought unnecessarily, I have put together some of my thoughts on the subject in the present paper. In a review,* the friendly spirit of which I most gladly recognize, Mr. Moschler speaks of my division of the old genus *Smerinthus*, which I have restricted to the type *ocellatus*, *geminatus*, &c., and says in effect that since hybrids are known to occur between certain of the species, these could not be generically or tribally separated.† This brings up the question as to what the value of the higher divisions really is. And a little reflection will, I think, show us

* Stettiner Ent. Zeit., 1875, pp. 202 et seg.

† "Denn in welche Tribus gehorten wohl die hybriden Nachkommen Beiden?" l. c. 208. Here the word *Tribus* is used, but the idea seems to be that of *Gattung*. At any rate "Tribus" is merely a still further extension of the idea of relationship and what objections I find applies to either.

that the higher divisions stand in a relative position to the "species." They are, in fact, extensions of the same idea. All are alike artificial in theory, and all classificatory terms are matters of practical necessity and convenience. As well might Mr. Moschler ask to what *species* do hybrids belong? Hybrids between distinct genera are noted elsewhere among animals. Collett has recently shown that the abnormal passion of the male ptarmigan in Norway leads to the production of hybrids between *Tetrao tetrix* and *Lagopus albus*. In fact this "abnormal passion" may be one of the means for the production of new species. Dr. Hagen* thinks that *Samia columbia* may be a hybrid between *Callosamia promethea* and *Samia cecropia*, species in my opinion strongly structurally and generically different. And Dr. Hagen further shows that interbreeding might be facilitated owing to the abundance of parasites which might check the due proportion of the sexes in either species. Perhaps, indeed, it may be rather owing to "abnormal passion," while the infested hybrid caterpillars might be additionally attractive to hymenopterous parasites. I am not favorably inclined to any "uniformity" in entomological nomenclature which will fall short in any way from a possible nearer expression of the facts in the case. The massing together in large genera of species offering structural peculiarities prevents our appreciation of these peculiarities, which is the point aimed at by systematic nomenclature. For instance, I cannot see why Mr. Riley, in his excellent article on the Hackberry Butterflies,† opposes the adoption of a different genus for our species, when he interestingly shows on the very first page that the allied European *Apatura* has a peculiar form, shape and arrangement of the wing scales.

Nor am I agreed that in proposing a generic name an author is obliged to construct a perfect diagnosis. The species being known to science, and all generic diagnoses being merely of comparative excellence, it cannot be expected that without a "uniformity" in comprehension there should be a "uniformity" in expression. Of course much depends on these points. Why a "uniformity" in generic designation should be so strongly urged when we see no "uniformity" in anything else relating to our mental development in the wide world, is difficult of comprehension. To me it seems that more exactness of definition is obtained by recognizing

* Bul. Buff. Soc. N. Sci., 2, 204.

† Trans. Acad. Sci., St. Louis, 1875, p. 193 et seg.

smaller peculiarities by a distinctive generic name, and that still, with every disposition to be particular, both Mr. Scudder and myself, finding that we cannot separate certain species generically, i. e. the species of *Polygonia*, *Smerinthus*, etc., are justified in feeling that our genera stand on a scientific basis. There must be differences of opinion in Entomology as in other matters. For instance, Mr. Morrison describes under the name of *Agrotis scropulana* * a species from the White Mountains, and says of it that its "delicate shades of brown, blue and creamy white place it among the most beautiful in the Noctuidæ." And another species, called by him *Agrotis opipara*, "almost approaches" the first "in beauty." The first to me seems very like the Labradorian *Pachnobia carnea*, the latter like *Agrotis islandica*. And it is obvious here that, if these resemblances are founded, we must examine our appreciation of the generic characters of *Pachnobia* carefully, that we may come to a clear understanding of whether we have to do with an *Agrotis* or not. And again, if my suggestions eventuate, we will have fresh affinities of the Mount Washington Insect Fauna with that of Labrador, and more material to illustrate the relationship of the animals which formerly may have taken refuge on Mount Washington during a period of the decline of the Glacial Epoch, when the body of the species moved further north.

ON SOME OF OUR COMMON INSECTS.

Drasteria erichtea, Cram.

BY THE EDITOR.

In fig. 12 we have this insect in the perfect state well represented.

Fig. 12.

Although it is one of our commonest moths, a day-flier, abundant almost everywhere, yet we have never heard of its having had a common name bestowed upon it. We are not going to christen it, for we are no admirer of common names where they can be avoided, and we think they can in this instance. *Drasteria erichtea* is not harsh and unpronounceable, as is the case with

* Psyche, 1, 42.

many, especially of our more recent names, as well as some that have been resurrected, and those who do not care to burden their memories with both names, may drop the latter and will still be understood if they speak of the moth as "the common *Drasteria*."

The female moth, when its wings are spread, will measure about one and a half inches; the male about a quarter of an inch less. The fore wings are grayish brown, with bands and dots of dark brown; one band crosses the wing about an eighth of an inch from the base, and a second —which sometimes does not extend entirely across—is placed midway between the first and the outer margin. There is a dull patch of brown near the front edge of the wing, between the first and second bands, and two or three prominent black dots similarly situated between the second band and the apex; the outer edge is also widely margined with brown.

The inner portion of the hind wings is similar in color to the front pair, the outer half is crossed by two darker bands irregular in outline, the space between them being occupied by a paler hue, as also is the space between the outside band and the hind margin, which latter is narrowly bordered with the darker shade. The markings on both wings vary much in intensity, being sometimes almost black, in other instances very faint.

The under surfaces of both wings are much paler, with the markings of the upper surface partially but indistinctly produced.

Drasteria erecthea appears among our earliest insects in spring, having passed the winter in the chrysalis state; it is also found up to quite a late period in the autumn. It frequents fields and meadows, and open grassy spots along the sides of our railroad tracks. Its flight is sudden, and after a short but rapid course, it as suddenly alights.

The caterpillar feeds on clover, and when full grown, measures one and a quarter inches in length or more. It has a medium sized head, rather flat in front, with darker longitudinal lines. The body above is reddish brown, with many longitudinal lines and stripes of a darker shade. There is a double whitish line down the back, with a stripe of the darker shade of brown on each side, and lower down close to the spiracles, is another stripe of the same dark hue, while between these two are faint longitudinal lines. The spaces between the segments, from fifth to eighth inclusive, are nearly black above, a feature only seen, however, when the body is coiled up; the larva readily assumes this attitude when disturbed.

The under surface is a little darker than the upper, with many longitudinal lines of a still deeper shade, and a central stripe of blackish green from the sixth to the ninth segments. The feet and prolegs are greenish and semi-transparent, with faint lines and darker dots. This larva has but three pairs of prolegs, and hence it alternately arches and extends its body in progression.

The specimens from which the above description was taken were full grown by the third week in September, when they became chrysalids, and remained in that condition until early the following spring.

ON A NEW SPECIES OF TRICOPIS AND HOMOHADENA, AND REMARKS ON HOMOHADENA INDUTA.

BY LEON F. HARVEY, M. D., BUFFALO, N. Y.

Tricopis alencis. n. s.

This species, collected by Mr. G. H. Belfrage, in Bosque Co., Texas, Sept. 16th, differs from *T. chrysellus* by the broader, more olivaceous basal and median fasciae, narrowly united along the hind margin of the wing. The white fields of the primaries are thus less extended than in its congener. Subterminal line diffusely shaded with olivaceous, as is the terminal margin, leaving a whitish apical space. Fringes whitish, thorax light olivaceous. Hind wings less purely white, with a terminal olivaceous shading. Beneath much as in its ally, than which this is a smaller species, expanding 23 m. m. Mr. Belfrage regards this as a distinct form, and sends it under the number 117.

In a separation of the species with armed tibiae from *Heliothis*, the genera *Eulecyptera* and *Tricopis* I cannot consider with Mr. Morrison as synonymous, since the structure of the fore tibiae offers points of distinction which must be insisted upon in order to obtain a natural arrangement of the species. Only those names in Entomology are correctly styled "synonyms" which apply to equivalent forms.

Homohadena figurata. n. s.

The body vestiture is scaly, mixed slightly with hairs. The size is that of *induta*. The color is more grayish than usual, and the basal

streak is wanting in the specimen. The uniformly dark griseous primaries have the median lines alone visible; these are narrow, black, approximate, of the usual K-shape, fused by a black dash below median vein. A series of terminal narrow black streaks. Fringes long, silky gray. Hind wings almost uniformly fuscous with whitish fringes, beneath paler with traces of a transverse line and a discal dot. Fore wings fuscous, with an outer line. Thorax and head like fore wings in color. Expanse 30 m. m. *Hab.* Nevada, Mr. Hy. Edwards, No. 2745.

The statement of Mr. Morrison, in the May number of the CANADIAN ENTOMOLOGIST, that *Homohadena induta* was the same as his *H. retroversa*, I read with surprise. From the description of the latter, after careful study, I had supposed it a redescription of *H. kappa*. Mr. Morrison says of *retroversa*: "coloration of *H. badistriga*." This is not true of *induta*, which wants the brown tinge entirely. He says the ordinary spots have "broad white annuli." This cannot be said of *induta*. Again, "the basal streak is obsolete," This is not true of *induta*, but of *kappa*. "The posterior wings are as in *badistriga*, etc.," he gives as another character, but it will not apply to *induta*. Mr. Morrison departs often from some more usual terms for color, which on that account renders it difficult at times to determine an insect from his descriptions. I feel that I have a sufficient excuse for my description of *induta*, while I am not prepared to admit the truth of Mr. Morrison's proposition that he has originally intended my species under the name of *retroversa*. I am not aware of *induta* occurring in Missouri, while Mr. Riley thought from a casual examination of *H. kappa* that he had taken that species in that State.

ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

We would invite the especial attention of all American Entomologists to the following paragraph, which appears in the circular recently issued by the Secretary of the A. A. A. S.:

"The attention of persons specially interested in Entomology is directed to the action taken by the Entomologists at the Hartford meeting, and to the fact that there will be a meeting of the Entomological

Club of the Association at Detroit, on Tuesday, August 10th (the day preceding the meeting of the Association), at which all interested are invited to be present."

We trust that a large number of Entomologists will respond to this invitation, and bring with them everything new and rare which they can lay hands on. It is especially desired that authors bring the types of new species as far as possible.

C. V. RILEY, Secretary Ent. Club, A. A. A. S.

CORRESPONDENCE.

LUNA AND PROMETHEA.

DEAR SIR,—

In the last number of Mr. Strecker's work he states that neither *luna* nor *promethea* occur at Montreal, P. Q. My friend was led astray in this matter by my asking him for these species in exchange. In my letter I said that I had not taken them, and he very naturally concluded from that statement that they did not occur here. Both *luna* and *promethea* have been bred here by several collectors, but they are rather scarce in this locality.

Yours truly,

F. B. CAULFIELD, Montreal, P. Q.

BOOK NOTICES.

We have received from the author, with many thanks, a copy of his 7th Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri, by C. V. Riley, State Entomologist, 8vo., pp. 196, with maps and illustrations.

This excellent report opens with a chapter on the Colorado Potato Beetle, in which is given information regarding the spread of the insect and the injuries inflicted by it, the use of Paris green and its influence on the plant and soil, as well as other details of interest. The Chinch Bug is next treated of in a more lengthy chapter, in which its history past and present

is fully given, with instruction in the use of remedies for its suppression. The Flat-headed Apple Tree Borer next claims a share of attention ; in this chapter a new parasite *(Bracon charus)* on the larva of this pest is described and figured. Following these are chapters full of interesting details in reference to Canker Worms, the Grape Phylloxera and the Rocky Mountain Locust. The work is furnished with an excellent index, and is written in a popular style, and is altogether a valuable contribution to our knowledge in the useful department of economic Entomology.

The Cincinnatti Quarterly Journal of Science, Vol. 2, No. 2. This number opens with an article on the Tineina of the United States, from the pen of our esteemed friend, V. T. Chambers, Covington, Ky. In this paper 32 new species are described and one new genus.

Among other interesting papers in this serial we notice one on Mastodon remains in Ohio, by John H. Klippart, Rambles of a Naturalist in South Florida, and The Use of Mica Plates by the Mound Builders ; The Age of their Mounds, by S. S. Scoville, M. D.

BOOKS RECEIVED.

Synonymic List of the Butterflies of North America, North of Mexico (Nymphales), by Samuel H. Scudder. From the Bulletin of the Buffalo Society of Natural Sciences, February, 1875, 8vo., 30 pp.

Curious anomaly in history of certain larvæ of Acronycta oblinita Guen., by Thos. G. Gentry, 30 pp., from Proc. Acad. Nat. Sci., Philadelphia.

English Sparrows, by Thos. G. Gentry, from the American Naturalist.

Proceedings of the Boston Society of Natural History, Vol. 8, October to December, 1874.

Proceedings of the Academy of Natural Sciences, Philadelphia, October, November, December, 1875.

Newman's Entomologist to April, 1875.

The Zoologist to April, 1875.

The Scottish Naturalist, April, 1875.

The Horticulturist to June, 1875.

Journal of Education to May, 1875.

Nature to February 18th, 1875.

Science Gossip to May, 1875.

Psyche to May, 1875.

Le Naturaliste Canadien, 1875.

Monthly Report of the Department of Agriculture.

Prairie Farmer.

Indiana Farmer.

Canada Farmer.

Observer of Nature to June.

The Canadian Entomologist.

VOL. VII. LONDON, ONT., JULY, 1875. No. 7

IMPORTANT TO ENTOMOLOGISTS.

In our last we briefly called attention to the fact that the Entomological Club of the American Association for the Advancement of Science would hold its first regular meeting on Tuesday, August the 10th, (the day preceding the meeting of the Association), at Detroit, Michigan. This organization of Entomologists, effected last year at the meeting in Hartford, promises to be an important one, embracing, as it does, within its ranks most of the leading Entomologists in America. Doubtless many important subjects will come up for discussion during the meeting, and among the rest (although we do not speak authoritatively) we doubt not but that the vexed and vexing subject of Entomological nomenclature will claim a fair share of attention. We sincerely hope that some rules will be devised which will result in establishing definitely and permanently the names by which we are to know many of the common insects which surround us, and that some limit will be placed to this everlasting searching among dry bones and continuous resurrecting of names from the musty records of the past, where in the interests of our favorite science they might in many instances have better remained forever forgotten. We do not propose to discuss here the subject of the question of priority, but we do firmly believe that we need the establishment of some rules by which the permanency of our names may be assured, if we do not wish to discourage and disgust the greater number of those valuable working members of our corps who have not time to investigate the merits of the various claims set forth by those who endeavour to lead us in these matters, but who are in many instances as much at variance with each other as the great bulk of the rank and file are disposed to be with them all; not—let it be understood—at variance with them personally; on the contrary, these persevering and talented labourers are held in the highest esteem, but it is felt that in their zeal in defence of the dead they are imposing on the living burdens unnecessary and grievous to be borne.

We anticipate that a large number of specimens will be brought together for the purposes of comparison and obtaining names, and thus much valuable information be elicited. We bespeak a large attendance

of our "brethren of the net," and trust we shall not be disappointed, but that all who *can* come *will* come, and thus aid in sustaining the interest of the meetings. The Club is well officered; President, Dr. J. L. Le Conte; Vice-President, Samuel H. Scudder; Secretary, C. V. Riley. Mr. Riley, who is now in Europe, writes that he hopes to return in time to be present at the meetings.

In accordance with a resolution adopted at the time of the organization of the Club, the first meeting will be held at 2 : 30 p. m. on the day named.

ON LYCÆNA NEGLECTA, Edw.

BY J. A. LINTNER, ALBANY, N. Y.

In the very interesting paper of Mr. W. H. Edwards, published in the May number of this journal, in which another valuable addition is made to the knowledge of our Lepidoptera, by the identity therein shown of the Lycænas *pseudargiolus* and *violacea*—autumnal and vernal forms of the same species—it is suggested that *neglecta* and *lucia* may prove to bear the same relationship to one another. The possibility of this is inferred by Mr. Edwards from observations made by him, that *lucia* is an early spring form (April and May in New York), and *neglecta* a later one, "occurring at intervals from June till September."

I cannot believe that *neglecta* and *lucia* will ever be united as seasonal varieties of the same species. Several years of diligent collecting by Mr. Meske and myself in this portion of the State, embracing a range of ten miles of territory, have failed to reveal a single example of *lucia*, nor has it come under our observation in any of the collections made by others in this part of the State. We might, therefore, be almost justified in asserting that it does not occur here. We have it from Long Island collected by Mr. Graef and Mr. Tepper.

On the other hand, in that famous collecting ground, Center, on the "pine-barrens," midway betweeen Albany and Schenectady, upon the line of the N. Y. Central and Hudson River R. R., than which, we believe, the Northern United States can produce no superior locality for the Lepidoptera, *neglecta* usually, at its proper season, swarms. There have been times and seasons when, as we have traversed the roadways leading

over the yellow sands of Center and among its pines, that the air about us has seemed blue from the myriads of *neglecta* driven up from the damp sands by our approach. Here, certainly, one might confidently look for *lucia*, were it but a varietal form.

Our observations and records do not agree with those of Mr. Edwards, giving June as the earliest appearance of *neglecta*. From notes made by me, and from dates of capture appended to examples in my collection, I cite the following:

In the year 1869, on May 21st, *neglecta* occurred in great abundance, all of which noticed, with three exceptions, were males. The worn condition of some of the captures indicated that they had already been abroad for several days. The locality had not been explored since the 11th of May, when the species was not found. About the 9th of June it was observed at its greatest abundance; it was seen for the last time during this year on the 30th of July. In 1870, it was first observed on the 14th of May (none in a collecting trip on the 6th). The last recorded appearance was on the 16th of June. *L. comyntas* was seen from May 6th to Sept. 14th, continuously. In 1871, *neglecta* is recorded from May 16th to June 16th. In the following year its first record is on May 21st.

The latest date of my capture of this species is August 20th, at Schoharie, N. Y.; the earliest is at Bath-on-the-Hudson, near Albany, on May 14th (the year not stated).

The observations which I have given above, when coupled with those of Mr. Saunders appended to the paper above referred to, of the frequent occurrence of *neglecta* in his neighborhood (London, Ont.,) and non-occurrence of *lucia*, would seem almost to establish beyond question their non-identity. That these statements may receive all the consideration to which they are entitled, it may be proper to accompany them with the mention made to me by Mr. Scudder, not to be construed to the disparagement of the valued labors of others, that, as the result of an elaborate tabulation of the numerous returns made to him or collated by him, of the Rhopalocerous fauna of the various portions of the United States, the two most thoroughly worked up fields were found to be those of London, Ont., and Albany, N. Y.

As a part of the history of *neglecta*, it may deserve mention that Mr. Meske reports the species as quite rare this year at Center, where in so many preceding years it has abounded.

TINEINA FROM CANADA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Gelechia basqueella.

Œcophora basqueella, ante p. 92.

By some unaccountable error, this species is described *loc. cit.* as an *Œcophora*, while a true *Œcophora*, which I intended to publish as *Œ. australisella*, does not appear at all. I have received *G. basqueella* from Prof. Riley, taken in Missouri, as well as from Texas.

A small collection of Tineina from Canada, received by me from Mr. F. H. Belanger, of the Universite Laval, Quebec, contains the following species, all of which, with, perhaps, two exceptions, are now in the collection of the University.

Tischeria bodicella Cham.

Coleophora coruscipennella Clem. (It is proper to state here that the species described by me as *C. auropurpuriella* is the same previously described by Dr. Clemens under the above name. I have taken it at Covington, Kentucky, and at the Bee Spring camp of the Kentucky Geological Survey, near Mammoth Cave.)

Coleophora cretaticostella Clem. ? I have also taken this species at Covington, but I identify it doubtfully as Dr. Clemens' species, because Dr. Clemens says "palpi white," while in these specimens they are yellowish; and Dr. Clemens also says "inner margin of the forewing whitish," which is not correct as to these specimens. In other respects Dr. Clemens' description applies accurately enough.

Tinea tapetzella Auct. ?

This species is described as having the labial palpi white, with the outer surface of the second joint dark brown. The specimen before me differs by having them ochreous, with the outer surface of both joints brown. It differs also from all descriptions of *T. tapetzella* that I have seen in having the tips of the thorax and patagia reddish ochreous, though in all other respects (even to the *Ex. alar* 9 lines) it is *T. tapetzella*. I therefore place it doubtfully as that species. *T. tapetzella* is a well

known European species, feeding in dry goods, &c., and has never been described from America except in the instance of a single specimen described by Dr. Clemens from Virginia, and Dr. Clemens did not know whether that was bred in America. I have never seen it, unless the specimen in Mr. Belanger's collection be the same.

Tinea pellionella ?

This well known European insect has not heretofore been recorded from this country. One of the two specimens now before me was bred from a larva taken in its case in a house in Covington ; another taken at the same time and place produced an Ichneumonide parasite. The other specimen was received from Mr. Belanger. Both these specimens lack the obscure brown spot on the disc of *T. pellionella*, but have the spot on the fold and at the end of the cell, and otherwise agree with the descriptions of *T. pellionella* The case of my bred specimen was made of pieces of carpet.

Solenobia Walshella Clem.

Tinea auropulvella Cham., *ante v. 5, p. 90.* Mr. Belanger's specimen is in better condition than any of those from which I described the species, and I am enabled to correct the former description as follows : The dusting of the wings is not so much scattered as might be inferred from that description, and is more properly described as pale ochreous than as reddish or brownish golden, though in some lights they exhibit these hues distinctly. The first and second brown costal spots near the base are connected along the extreme costa, and the "last one behind the middle" connects above the fold with a narrower pale ochreous streak, which passes obliquely forwards to the dorsal margin ; and the patagia are brown at their bases. In a previous paper I have described several species from Kentucky, which are white marked with brown, approaching the European *T. granella*, and in this paper shall describe several others. There seems to be an abundance of these species in America, and Dr. Clemens has described one as *T. variatella*, which Mr. Stainton suggests in his edition of the Clemens papers is probably *T. granella.* But after comparing my species and Dr. Clemens' description with Mr. Stainton's description of *T. granella* in *Ins. Brit., v. 3.*, I can not consider any of the described American species as *T. granella.*

Bucculatrix albicapitella Cham.

The specimen in Mr. Belanger's collection differs from all of my specimens in having the dorsal spot prolonged towards the apex till it meets in the apical part of the wing with the second costal streak, in having the apical spot more definite, and the dusting in the ciliæ so arranged as to form two short hinder marginal lines. I have no doubt it is the same species. The pattern of ornamentation (not the colors) of this species is almost exactly that of the *right* wing in Mr. Stainton's figure of *B. demaryella*, but the left wing in the figure is very different. *Vid. Nat. Hist. Tin., v. 7.*

Lithocolletis salicifoliella, CAN. ENT., *v. 3., p. 163.*

" *Scudderella* Frey. & Boll. ? *Ent. Zeitung, p. 212.*

In the collection received from Mr. Belanger is a single specimen of this species, together with the mined leaf of poplar, from which it was bred. It has heretofore been found only in Willow leaves. It is an exceedingly variable species, some specimens being so densely dusted with brown or gray brown scales as to suggest a resemblance to the European species *L. populifoliella*, whilst others are almost free from dusting, and may be described as having a ground color of pale golden or saffron marked with white. In the former description of this species I was led by the resemblance of the more densely dusted specimens to *L. populifoliella*, as figured by Mr. Stainton in *Nat. Hist. Tin., v. 2*, and the position in which *L. pastorella* is there placed in his classification of the species of this genus, to suggest that it might be identical with *pastorella*. Perhaps the following description may convey a better idea of an average specimen than the one previously given.

Thorax and primaries bright golden or saffron yellow, according to the light, or even sometimes dull brownish yellow, the thorax and basal portion of the dorsal margin of the fore wings being largely intermixed with white and dusted more or less with black; sometimes the inner angle is of the general ground hue, scarcely dusted or marked with either white or dark brown, and then there is a median white basal streak which meets at an acute angle with a dorsal white streak about the basal fourth of the wing length. Both of these white streaks and all other white markings on the wings are more or less dusted with dark gray brown, sometimes so much as to obscure the white. Before the middle of the costa is a long white streak, which attains the middle of the wing, curving backwards; a little behind this, on the dorsal margin, is a large dorsal white streak, wide

on the margin, but shorter than the first costal streak, like which it curves backwards along the middle of the wing, being usually confluent or very nearly so with the first costal streak; a little further back, about the middle of the costal margin, is another white costal streak shorter than the first, but like it curving back along the middle of the wing, and usually confluent with the first costal and first dorsal streaks. Then follows another narrower and somewhat oblique costal white streak, opposite to which is a triangular white dorsal spot separated from it by some brown scales; just before the ciliae is a curved white fascia concave towards the apex and sometimes interrupted in the middle, and just before the apex is another similar fascia, which, however, sometimes does not attain the dorsal margin, and behind it in the apex is a short brown streak. All these white streaks and fasciæ are decidedly dark margined before, and more or less dusted with grayish brown. There is a brown hinder marginal line at the base of the ciliae, which latter are stramineous.

In the former description the white dusted with gray brown was considered the ground color, and the golden or saffron as markings on that ground, as in *L. hamadryadella* Clem., and *L. sylvella* Stainton, and *L. populifoliella* Zell., and the species was considered as belonging to the same group with the latter. In this description I have perhaps more properly considered the golden or yellowish hue as the ground color, and the white dusted portions as the markings as in Mr. Stainton's group, *3*, *Nat. Hist. Tin., v. 2.* Hence the apparent difference.

Since the publication of my description of this species, Prof. Frey, of Zurich, has described under the name of *L. Scuderella* a species bred by him from mined Willow leaves, gathered in Massachusetts, which is probably identical with this. At my first examination of Prof. Frey's description I thought otherwise, being unable to recognize this insect in Prof. Frey's description, though they certainly agree in one peculiar characteristic, viz., dark brown bands on the first pair of legs, to which Prof. Frey first drew attention in his description. The discrepancies between my specimens and the Professor's description are chiefly in the markings of the fore wings. But these may result from the variations in the markings of the insect itself. Prof. Frey's specimens seem to have been remarkably free from the dusting of brownish or gray brown scales, and as I understand his description, one of the two fasciæ in the apical part of the wing is not mentioned. Still, considering the difficulty of describing an insect so peculiarly marked and so variable as this species, the probability is that it is *L. salicifoliella* Clem.

Prof. Frey notices the dark anterior surfaces of the legs in this species as remarkable, but the species is by no means singular in this respect. *L. tritaeniœella* and other species are marked in the same way, and I did not consider it important to mention this character in the original specific diagnosis of either species. Some specimens of *salicifoliella* are much paler than others, and occasionally the dark margins of the fasciae are very indistinct. Prof. Frey seems to have been misled by the mention of *L. pastorella* by me in connection with this species. I wrote that this species bore a strong *general* resemblance to *L. populifoliella*, as figured *(Nat. Hist. Tin.,)* and as in that work *pastorella* and *populifoliella* are placed in the same group, I wrote that "it is not impossible that this is *L. pastorella.*" *Pastorella* and *populifoliella* are known to me only through the *Nat. Hist. Tin.*, and comparing the most densely dusted specimens of *salicifoliella* with the figures in that work, I still think it should be placed in the same group with those species.

ON ORTHOSIA RALLA, Gr. & Rob.

BY J. A. LINTNER, ALBANY, N. Y.

In the April number of this journal, page 79, it is asserted by Mr. Morrison that "the well known *Orthosia ferruginoides* Guen. is re-described as *Xanthia ralla* Gr. & Rob."

Having examined the type specimen of *ralla*, in the possession of the Buffalo Society of Natural Sciences, I am able to pronounce it entirely distinct, and further, that it differs so much from the species to which it is above referred that there would seem to be no valid excuse for the erroneous reference.

In *ralla* the anterior wings are quite produced in their outer margin at vein 3, and considerably excavated thence to the costa; this marked feature is not fully shown in the figure, in Trans. Am. Ent. Soc., i, pl vii. The transverse lines are much more decided than in *ferruginoides*. The anterior transverse line is less sinuous; the post. trans. strongly lunulated line is quite distinct. The conspicuous interspaceal black dots constituting the subterminal line, might, by the the careless observer, be mistaken for the black nervular dots or dashes of the lunules of the preceding line in *ferruginoides*.. The orbicular has an interior black dot

and a black dash inferiorly, which *ferruginoides* has not, and its annulus is scarcely defined. The reniform contains inferiorly three black spots. The black dashes which mark the tips of the veins in this are not present in *ferruginoides*, and the fringes are more heavily cut with blackish in the former. In *ralla* the secondaries are pellucid, and without a trace of lines above, while in the other they show a median line, a subterminal band, and are fuscous toward their internal margin.

In view of the marked differences in the two species, it is believed that their pronounced identity is based on an erroneous determination of *ralla* or a simple recollection of its general appearance. It is much to be deplored that synonymical dicta so frequently find their way in print, to our perplexity or annoyance, manifestly wanting in the authority of critical observation or the use of available means of information. To such a neglect we are disposed to refer the recent union, as "dimorphic forms," of three well defined species of *Agrotis*, viz., *subgothica*, *herilis* and *tricera*—entirely unsupported by observations and experiments such as have placed the polymorphic and dimorphic forms of *Papilio ajax*, *Grapta interrogationis* and *Lycæna pseudargiolus* of Edwards, outside of the field of conjecture or prejudice, in a region of absolute certainty.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana : Insecta.

(Continued from Vol. vii, p. 113.)

[250.] II.—ORTHOPTERA.

FAMILY LOCUSTIDÆ.

344. LOCUSTA LEUCOSTOMA *Kirby*.—Length of body 13½ lines. A single specimen taken in Lat. 65°.

Body obscurely rufous, clouded with darker shades. Upper lip, and large spot of the mandibles, white; palpi reddish, with the two last joints whiter, summit black; antennæ as long as the trunk, which on the upper side is subpubescent; last segment of the prothorax carinated; tegmina

cinereous, with piceous and rufo-piceous nervures; and at the base is a longitudinal mesal series of black spots; the legs are rufo-testaceous, with the summit of the thighs and the spines black; the posterior thighs above are clouded with the same colour.

[Synonymous with *Caloptenus bivittatus* Say. This species is found in Canada and the New England States, as far south as Maryland and Texas, westward to Nebraska and Minnesota, and northward to Lake Winnepeg.

345. Locusta verruculata *Kirby*.—Length of body 12¾ lines. A single specimen taken in Lat. 57°.

[251.] Body cinereous, sprinkled with black dots or punctures, and indistinct spots. Head punctured; palpi white at the tip; mandibles piceous; antennae shorter than the trunk, pale, black at the tip and longitudinally concavo-convex; prothorax with an entire longitudinal dorsal ridge, wrinkled, and warty from the wrinkles; tegmina with a reddish tint, irregularly reticulated; wings with a black mesal band, and reddish-yellow nervures; abdomen pale underneath.

[Belongs to the genus *Œdipoda* Latr. Is taken in Canada and the New England States; has been found also at Lake Winnepeg.]

FAMILY ACRYDIADÆ.

346. Acrydium granulatum *Kirby*.—Length of body 5 lines. A single specimen taken in Lat. 65°.

Body black, sprinkled with numberless very minute elevated points or granules. Prothorax cinereous, clouded obscurely with black, three-ridged; with middle ridge straight, and the lateral ones curved at the base; rudiments of the tegmina cinereous, ridged, punctured with excavated punctures; nervures of the wings black, those of the costal area white; the four anterior tibiæ are reddish, obscurely banded or rather annulated with white.

[Belongs to the genus *Tettix* Latr. Taken by White in Sir J. Richardson's Arctic Searching Expedition, on the borders of the Mackenzie and Slave Rivers, and Fort Simpson. Found also in N. E. States and Minnesota.

[252.] III.—NEUROPTERA.

FAMILY AGRIONIDÆ.

347. Agrion puella *Linn.*

Variety B. Trunk sea-green, above black with two sea-green longitudinal stripes; abdomen black, sea-green at the base, inscribed with black; legs black above, underneath sea-green or white; the stigma of the wings is blackish with a transparent margin.

C. Trunk black and white with two dorsal white longitudinal stripes; legs black; stigma of the wings black; abdomen mutilated.

Both taken in Lat. 65°.

[Hagen (Synopsis of Neuroptera of N. A., p. 98) says that this is "perhaps another species which is inextricable."]

FAMILY PERLIDÆ.

348. PERLA BICAUDATA *Linn.*—Length of body about 7½ lines. Several specimens taken in Lat. 68°.

[253.] Body black, hairy. Antennae, tibiae, tarsi, caudal setae, and wings dull testaceous; the vertex consists of a yellowish membranous spot; the joints of the caudal antenniform organs are dark at the tip.

The larva is white underneath, fusco-cinereous above; head and thorax spotted with white, with a pale longitudinal line. More than one species seems to have passed under the name of *Phryganea bicaudata.* I will not affirm that the present species is not distinct: but as the specimens were not perfect, I thought it best to consider them as belonging to that type.

[Synonymous with *P. frontalis* Newman. Taken at St. Martin's Falls, Albany River, Hudson's Bay; at Trenton Falls, N. Y., and in Ohio.]

IV.—TRICHOPTERA.

FAMILY PHRYGANIDAE.

349. LIMNEPHILUS NEBULOSUS *Kirby.*—Length of body 7 lines. A single specimen taken in Lat. 65°.

Body black, hairy with whitish hairs. Antennae are mutilated in the specimen, but the base is black; scutellum testaceous; upper wings testaceous, spotted and dotted with white except the costal area, which is without any of that colour; under wings white with testaceous nervures; legs testaceous.

350. LIMNEPHILUS FEMORALIS *Kirby*.—Length of body 6½ lines. Taken with the preceding.

Very like the preceding species, but paler, with black scutellum and thighs.

[Both species are unknown to Dr. Hagen.]

ANNUAL MEETING OF THE MONTREAL BRANCH.

The second annual meeting of the Montreal Branch of the Entomological Society of Ontario was held on May 4th, 1875, when the following officers were elected for the ensuing year :—

G. J. Bowles, President ; Alexander Gibb, Vice-President ; C. W. Pearson, Secretary-Treasurer ; G. B. Pearson, Curator ; W. Couper, M. Kollmar, T. B. Caulfield, Council.

The reports of the Council and Secretary-Treasurer were read and adopted. The Branch is progressing steadily, and our list of membership is increasing. During the past year working expenses have all been paid, leaving a balance on hand ; a number of papers have been read, and the exhibitions of local and exotic rarities were exceedingly good. The Branch holds its meetings in the rooms of the Montreal Natural History Society, University St. All business communications to be addressed to

C. W. PEARSON,
The Burland Desbarats Co'y, Montreal, P. Q.

Annual Report of the Council of the Montreal Branch of the Entomological Society of Ontario :

Your Council, in presenting their second annual report, have great pleasure in stating that the Branch has progressed steadily since its first meeting in August, 1873. During the past year eight new members were elected, making the total number of twenty, one of whom has since gone to Europe.

The papers read during the year are as follows :

"Notes on the Larva of *Leucania pseudargyria* Gueneé," by F. B. Caulfield ; "On a Dipterous Insect Destroying the Roots of Cabbage," by Wm. Couper ; "Notes of Some Species of the Genus *Grapta*, found in

the Vicinity of Montreal," by F. B. Caulfield; "On Tineidæ," by Wm. Couper; "On Tineidæ," by F. B. Caulfield; "A List of the Bombycidæ of Quebec," by G. J. Bowles; "On the Catocalidae Occurring in the Vicinity of Montreal," by C. W. Pearson; "A List of the Diurnal Lepidoptera Occurring on the Island of Montreal," by F. B. Caulfield; "On the Usefulness of Spiders," by J. G. Jack; "A List of Sphingidae Occurring on the Island of Montreal," by F. B. Caulfield.

The monthly meetings were fairly attended, and the exhibitions of Entomological material conspicuously illustrated the energy of the members in accumulating rare insects from various localities. The Branch having decided to hold their meetings in future in the rooms of the Montreal Natural History Society, it was found necessary to change the night of meeting from the first Wednesday to the first Tuesday in each month, and in order to meet the extra outlay for rental, it was decided to make the subscription twenty-five cents a month, which the Council presume will suffice for present emergencies. On the 1st of last July the members proceeded to Chateauguay Basin for a field day. The members were the guests of Mr. R. Jack, of Hillside, who treated them with true hospitality.

Your Council have ordered *Psyche*, a useful Entomological publication issued in Cambridge, Mass.

A suggestion made by your Council last year, that note books should be carried by members, has, in this instance, been fruitful in producing valuable lists and data of the occurrence of insects in our neighborhood, and we trust that some of our members will devote their leisure this season to the much neglected orders of Hemiptera, Neuroptera and Diptera.

All of which is respectfully submitted.

G. J. Bowles,
Wm. Couper, Chairman. C. W. Pearson.

NOTES ON CALOPTENUS SPRETUS.

BY G. M. DODGE, GLENCOE, DODGE CO., NEBRASKA.

The natural history of the migratory grasshopper, *Caloptenus spretus* Uhler, being imperfectly known even to our best western Entomologists, I have given the subject considerable attention during nearly two years

residence here, where I have had ample opportunity for observation. My most important discovery is that this species is double brooded. This is evident from the fact that in 1873 large numbers came here from the south, laid eggs and produced a second brood that flew south in August of the same year. This accounts for their migrations. They can not be local anywhere, because there would not be sufficient herbage to support a second brood in a region already laid bare by the first; and because in the northern part of their range the season is not long enough to mature two broods. They must, therefore, migrate every year; and their migrations are conducted as follows:

Hatching in Texas, New Mexico and Arizona early in spring, these insects, as soon as matured, fly north and deposit their eggs on this latitude about the last of May, although they arrived here this year as early as May 12th. They probably do not lay many eggs south of Nebraska, but they go much farther north. The second brood being able to fly in August, goes south with the first favorable wind, reaching Texas in September, where they deposit eggs to lie over winter. But as eggs were deposited by the first brood all along their route, from Kansas probably to the northernmost limit of vegetation; the young from these eggs are proportionally later, and, as they acquire their wings and fly south during the autumn months, each successive brood necessarily falls short of the extreme southern limit reached by its immediate predecessor, and many being retarded by contrary winds, cold and storms, eggs are deposited over nearly the whole extent of country traversed by their ancestors in the spring.

The next spring, the new brood hatching in Texas and all hatching farther north that acquire wings earlier than the 20th of June or 1st of July, fly north, while those maturing later fly south. They deposit eggs that produce a second brood, as before, which lays eggs for the spring brood. The second brood always flies south. Thus we see that this grasshopper is not forced upon its migrations for want of food, as is commonly asserted by Entomologists, but is guided in its flights by that instinct which teaches every insect to provide for its young. The natural habitat of this insect is probably the plains lying east of the Rocky Mountains, where it goes through its annual migrations as I have described. Now, let us see how it can spread into the cultivated districts of the Mississippi valley without moving directly east. When ready to fly, it always waits for a favorable wind; and, if it is going north, will take

advantage of a south, south-east or south-west wind upon which to travel. If, then, they leave their hatching ground in the far south with a south-west wind, they would be carried far to the east before reaching their northern limit. Likewise, when the second brood was ready to fly south, if the prevailing winds should come from the north-west, the hordes would be swept over Nebraska, Kansas, etc., and into Texas. A continuous south-west wind the next spring would take the spring brood still farther east, while, on the other hand, south-east winds would carry them back toward the plains.

As the *C. spretus* always leaves its hatching grounds without depositing eggs, Entomologists have jumped to the conclusion that broods raised on the plains are barren or incapable of producing young; but the fact is that they are not ready to deposit until two or three weeks after getting their wings, which time they invariably take advantage of to remove themselves several hundred miles from their place of birth.

NEW NOCTUIDAE.

BY LEON F. HARVEY, M. D., BUFFALO, N. Y.

ERRATA.—In my article in the last number, *Tricopis alencis* should read *Tricopis aleucis*.

Tarache lactipennis, *n. s.*

Allied to *cretata*, but very much larger. Head, thorax and a narrow oblique basal patch deep brown. A metallic tuft on the thorax behind. Fore wings milk white. A subterminal broad, deep, olive shade from apices to internal margin, containing a narrow, dentate, lilac-white line. A greenish costal spot at about apical third. Terminal space whitish, with a terminal dark shade line. Hind wings and abdomen white, the former with a very slight fuscous edging. Beneath primaries wholly dark, except along internal margin; hind wings wholly white. *Expanse* 28 m. m. *Habitat* Texas (G. W. Belfrage, May 3, No. 111.)

Differs from *Tarache metallica* at once by the white secondaries and abdomen, as well as the absence of costal basal marks and the dentate

continuous lilac-white subterminal line. Perhaps the handsomest species of the genus, some of the American species of which appear to imitate *Eudryas* in their green and olive colors, as already suggested by Mr. Grote.

Ipimorpha intexta, n. s.

Allied to *I. pleonectusa* Grote. More slender in form and of a darker color. Thorax and primaries blackish olivaceous, abdomen concolorous with secondaries. Median lines trapezoidal, very nearly meeting at internal margin, even, dark, followed by a yellowish shade; orbicular subquadrate; reniform posteriorly excavate, borders concolorous with median lines; outside of t. p. line, wings a little paler, subterminal line faint, of the usual irregular shape; terminal line pale at base of fringes, bordered inwardly by a series of almost black scalloped spots; fringes blackish. Below, light ochreous, shaded with fuscous; a yellow costal apical shade. Secondaries light brown, terminal line well marked, bordered inwardly with a dark shade; beneath concolorous, with double lines faintly indicated; fringes concolorous. *Expanse* 33 m. m. *Habitat* Sharon Springs, N. Y. (O. Meske.)

I refer this species to *Ipimorpha* rather than to *Calymnia*, from the shape of the wings and an apparent indication of a thoracic tuft.

Homohadena incomitata, n. s.

In tone, color and size resembling *induta*. There is no basal dash and no markings except the median lines, which differ from *induta* in shape. They meet very nearly at internal margin. The outer line runs inwardly obliquely from its subcostal extension without being sub-medially indented opposite the basal dash, as in *induta*. The subterminal nervular dashes are sub-obsolete. The black lines are a little more broken and denticulate than in *induta*, in some specimens sub-obsolete.

Hind wings with very faint traces of the median line, which *induta* shows plainly, and is said to be absent in *retroversa* as in *kappa*. Beneath the line is fragmentary. From the fact that *induta* has a median line beneath and "*retroversa*" is said to have none, and has a basal dash on forewings and "*retroversa*" is said to have none, there is a chance that Mr. Morrison intended *incomitata*, which differs from *induta* in both these points. Mr. Morrison says, however, that he described *induta*; in this case, I think Mr. Morrison's description may with propriety be discarded from the facts in the case *Habitat*, Texas (G. W. Belfrage, No. 75.)

CORRESPONDENCE.

DEAR SIR,—

In accordance with request in last C. E., I send you a list of some captures of Diurnal Lepidoptera, made by me in various localities :

1. Danais erippus (everywhere.)
2. Euptoieta claudia, N. Y., N. J., Oh.
3. Argynnis atlantis, Pa,
4. " bellona, N. J., Oh.
5. " myrina. N. J.
6. " idalia, Mass., N. J.
7. " cybele, Mass, N. J.
8. " aphrodite, N. J.
9. Phyciodes tharos, N. J.
10. " nycteis, Oh.
11. Vanessa interrogationis, N. Y., N. J.
12. Vanessa faunus, N. Y., N. J.
13. " comma, N. Y., N. J.
14. " progne, N. Y., N. J.
15. " antiopa, (wide.)
16. " var. album, N. J.
17. Pyrameis atalanta, N. J., N. Y., Oh.
18. Pyrameis cardui, N. J.
19. Junonia coenia, N. J., Oh.
20. Apatura idyia (clyton), N. J.
21. Lybithea motya (very rare), N. J.
22. Lycæna thoe, N. J.
23. " phleas, N. Y., N. J., Oh.
24. " comyntas, N. Y., N. J.
25. " violacea, N. Y., N. J.
26. " neglecta, N. Y., N. J.
27. Thecla damon (smilacis), Md.
28. Eurema nicippe, N. J. (rare), Md., Oh.
29. Eurema lisa, N. J., Oh., Md.
30. Pieris protodice, Pa., Md., Oh.
31. " oleracea, N. Y.
32. " rapae, N. Y., N. J., W. Va., Oh.
33. Catopsilia eubule, N. J. (rare.)
34. Meganostoma caesonia, Oh.
35. Colias philodice (wide.)
36. Papilio philenor, N. Y., N. J., Oh.
37. Papilio hesphontes, Mich.
38. " ajax, Mich., Oh.
39. " turnus, N. Y., N. J.
40. " var. glaucus, N. J.
41. " troilus, N. J.
42. " asterias, N. Y., N. J., Oh.
43. Thymele tityrus, N. Y., N. J., Oh.
44. Thorybes bathyllus, N. J.
45. " pylades, Pa.
46. Pamphila ahaton, N. Y., N. J., Oh.
47. Pamphila huron, W. Va., Md.
48. " wamsutta (wide).
49. " hobomok, N. J.
50. " massasoit, N. J.
51. Thymeticus Delaware, Pa.
52. Thecla favonius, N. Y.
53. Nisoniades brizo, Mass., N. J.
54. " catullus, N. Y., N. J.

The localities of the above species (captured by myself) may be relied on.

W. V. ANDREWS.

36 Bœrum Place, Brooklyn, N. Y., June 2nd, 1875.

DEAR SIR,—

As long ago as August 13th, 1829, Hentz, writing to Harris, notices the fact that *Megacephala (Tetracha) Virginica* and *Carolina*, although externally like *Cicindelæ*, have the habits of the *Carabidæ*. May I ask if any good reason can be assigned why this genus should not be placed after *Cicindela* and not before it, thus bringing it into closer proximity to the family to which it seems to be most closely allied? See Harris cor., p. 77 and 78.

W. V. ANDREWS.

New York. March 29th, 1875.

DEAR SIR,—

I venture to suggest an improvement in Mr. Chase's "Cyanide Box," as described in your May No.

For reasons obvious enough to the chemist, the plan of dissolving the Cyanide of Potassium in water is not so good as that of pounding it and intimately mixing it with the Plaster of Paris, the water being unable to take up but a comparatively small quantity of the Cyanide. On page 208 of your fifth volume I gave a good recipe for making a collecting box.

W. V. ANDREWS.

36, Boerum Place, Brooklyn, N. Y., June 21st, 1875.

DEAR SIR,—

In number 12 of Mr. Strecker's work, it is claimed that his number 11 was printed in "August, 1874." I have before drawn attention to the fact that I can find no record of the issue of any nnmber of this part before November. The point is raised on account of the publication by myself of three species of Catocala in the Trans. Am. Ent. Soc. for September, 1874, claimed to be superseded by Mr. Strecker's notice of the same species in "August." I am of the opinion that a work published privately and irregularly by an author should not take precedence over one published by a Scientific Society, on testimony consisting of the mere assertion of the interested author. It is possible that persons who live nearer Reading than I do may be in possession of facts which will show that none of Mr. Strecker's dates are reliable. For myself I think they are not accurate from a variety of circumstantial evidence. In one case a species is described under a date apparently before it could have been received by Mr. Strecker. I should have been glad to have noticed that Mr. Strecker had added his synonyms of *C. illecta* Walk. (= *C. magdalena* Strecker) and *C. nuptialis* Walk (= *C. myrrha* Strecker) to his other corrections.

In his disquisition on *Samia columbia*, Mr. Strecker thinks Dr. Hagen's suggestion might be true as to its being a hybrid between *promethea* and *cecropia*, were it not that *promethea* does not occur at Montreal. He has been already corrected on this point in the CANADIAN ENTOMOLOGIST; there is also the fact that *columbia* is described originally from Maine. The fact that *Gloveri* is suggested by Dr. Hagen to be = *columbia*, is also sagaciously left out of sight by Mr. Strecker.

With reference to *Californica*, Mr. Strecker does not know my paper published in the Trans. of the American Philosophical Society, Nov., 1874, or chooses to ignore it. His ignorance as to where *Californica* is described shows an unacquaintance even with the publications of the Entomological Society of Philadelphia, and I have shown that the synonymy in his work is copied from catalogues, etc., and is no proof of bibliographical knowledge, and therefore quite superfluous. And while Mr. Strecker very properly quotes Mr. Kirby's correction of my generic name, he purposely ignores the fact that Mr. Kirby retains for the species from the West the name *Samia Californica*, to which I believe it to be justly entitled, although Mr. Strecker calls it "*Euryalus*."

A. R. GROTE.

DEAR SIR,—

In the "Preliminary List of the Noctuidæ of California," CAN. ENT., 7, 68, I have cited a species under the number 107 with the name *Agrotis excellens*. This name is used by Dr. Staudinger for a different species previously, and may be changed for the Californian species to that of *Agrotis perexcellens*.

A. R. GROTE.

INSECT CAPTURES.

In our issue for July, 1874, p. 140, we noticed some rare and interesting captures made by one of our members, Mr. F. C. Lowe, of Dunnville, Ont., during a tour made by him in the county of Essex. At that time, when near the village of North Ridge, he secured a very handsome and perfect specimen of *Papilio marcellus* (the second recorded specimen taken in Canada), and saw on the wing two others which he did not succeed in capturing: besides which, he took several specimens of *Papilio thoas*, a species also extremely rare in Canada. These, with many others, were taken between the 10th and 20th of June.

This year, Mr. Lowe revisited the same locality, occupying the time between the 6th and 30th of June in exploring that district, with the view of securing further specimens of *marcellus*. In this respect his zealous and praiseworthy efforts have not been crowned with success; not a single *marcellus* was seen during the whole period; probably the chrysalids had perished in consequence of the severity of the past winter. Several *Papilio thoas* were seen, but none taken.

Among his captures we observed two handsome examples of *Limenitis ursula*; also, fine specimens of *Papilio troilus* and *asterias*, *Eudamus tityrus*, *Neonympha eurytris*, *Hesp, oileus*, *Alypia Langtonii*, *Spilosoma collaris* Fitch (said to be a variety of *Euchetes egle*), *Baptria albovittatta* and several other species which we were unable to determine. There were also several handsome Diptera and Hymenoptera.

Among the Coleoptera was a female specimen of *Phanaeus carnifex*, captured near Windsor, an insect, so far as we know, never before taken in Canada; also, good examples of the following species: *Trichius bidens*, *Desmocerus palliatus*, *Clytus speciosus*, *Ædilus obsoletus*, *Cetonia fulgida*, *Cotalpa lanigera*, *Necrophorus Americanus*, *Callandra pertinax*, several handsome Curculios new to us, besides a number of other species less noteworthy.

BOOK NOTICES.

Field and Forest.—We have received the first two numbers of this new periodical, devoted to general Natural History, to which we tender a cordial welcome. It is an eight-paged monthly, uniform in size with our own journal, in every respect well got up, and containing many things to interest the Entomologist, the Botanist and general Naturalist. It is edited by our esteemed friend, Chas. R. Dodge, of the Agricultural Department, Washington. While this serial is to be devoted to Natural History in general, it will also be the Bulletin of the Potomac-side Naturalists' Club of the District of Columbia. Under the control of such an energetic and pains-taking man as we know the editor to be, we doubt not but that this journal will prosper, and be the means of furthering the interest of many departments of natural science. We sincerely wish it long life, and commend it to our readers. It is published at one dollar per annum; address—Editor "Field and Forest," P. O. Box 273, Washington, D. C.

The Canadian Entomologist.

VOL. VII. LONDON, ONT., AUGUST, 1875. No. 8

ON SOME OF OUR COMMON INSECTS.

THE LUNA MOTH—Actias luna Linn.

BY R. V. ROGERS, KINGSTON, ONT.

If any of the insect host is a proof of high art in nature, and of the beauty of the Creator's thoughts, it is most assuredly the fair creature whose name is mentioned above. Allied to families whose members are among the greatest of the insect world, and having cousins and connections surpassing in size and beauty all others of their kingdom in this Dominion, still this moth is as pre-eminent above its fellows as is its namesake—the fair empress of the sky—above the lesser lights that rule the night.

So conspicuous is the Luna in her royal robes that she has a right to feel slighted at being thus long almost unnoticed in the pages of the ENTOMOLOGIST, and now it is hard upon her to be described among "Some of our Common Insects;" but blue blood always tells, and queenly grace and beauty will ever distinguish the Luna from among the *profanum vulgus* of the Articulata.

And now for a biographical sketch of this beauty from the cradle to the grave, and beyond that, after it assumes the resurrection attire, to that day when, its work accomplished, it lays itself down that its body may mingle again with its parent dust.

The head of the caterpillar is nearly elliptical in shape, and of a pearl color; the rest is of a delicate pale and very clear bluish-green color. A very pale yellow stripe extends along each side of the body, from the first to the tenth segment, just below the line of the spiracles; and the back is crossed, between the rings, by narrow transverse lines of the same color. After the manner of its kith and kin, each segment is adorned with small pearly warts—tinged with purple—five or six in number, each furnished with a few little hairs. At the end of the tail are three brown spots, edged above with yellow.

When at rest, this magnificent caterpillar (which, by the way, is very similar to that of its congener, *Telea polyphemus*, save that the latter is destitute of the lateral yellow stripe, and the bands between the segments, the tail being bordered by a brown V-shaped mark) is nearly as thick as a man's thumb ; its rings being bunched and body shortened, the length is only about two inches, but when it sets out on its travels, it stretches itself to about three inches. In the CAN. ENT. (vol. 6, p. 86) Mr. Gentry describes an interesting variety in which the general color is a dull reddish brown ; the lateral and transverse stripes of yellow have vanished, the abdominal spots shine conspicuously, but without the yellow edging ; the pearl colored warts with their purple edge have, however, assumed a richer hue, and blaze like a coronet of rubies.

When the larva has passed its allotted days in eating the leaves of the hickory, beech, oak, or walnut, and is thinking seriously of preparing its silken shroud and the casket in which it is to lie until its resurrection morn, it casts about and draws together two or three leaves of a tree, and within this hollow spins an oval and very close and strong cocoon of whitish silk. It is about 1¾ inches in length, of a chestnut brown on the outside ; very thin, and frequently rough on the surface ; covered with warts and excresences, but seldom showing the print of leaves. Harris says that the cocoons are formed on the trees, and that they fall to earth with the leaves shaken off by autumnal gales ; but other observers assert that the larva crawls to the ground just before its change, and there prepares for its future transformations.

In this state, too, the Luna greatly resembles the Polyphemus, and many a collector having—after careful searching—got together a fair supply of what he deems Luna chrysalids, is greatly chagrined by finding dusky, one-eyed, giant Polyphemi issue from the silken tombs, instead of a bright throng of empresses of the night in their delicate bridal attire. The Polyphemus cocoons are, however, white or dirty white ; rather smaller than the Lunas, with rounded ends ; sometimes angular, because of leaves moulded unevenly into the surface, and generally coated with a white powder.

About the month of June the Lunas awake from their long and death-like sleep, burst asunder their cerements—having first loosened the compact threads by ejecting a liquid—and issue forth in all their glory, no more to be mistaken for the sober one-eyed Cyclopeans, but resplendent in gay attire. The wings, which expand from 4¾ to 5½

inches, are of a delicate light green color, and the hinder ones are each prolonged into a tail of an inch and a half or more in length, longer, indeed, than those of the day-flying Papilios. Along the front edge of the fore wings is a broad purple-brown stripe, extending also across the thorax, and sending backwards a little branch to a glittering, eye-like spot near the middle of the wing. These eyes (of which there is one on each of the wings) are transparent in the centre, and encircled by rings of white, yellow, blue and black. The hinder borders are more or less edged with purple brown. All the nervures are very distinct and pale brown. Near the body the wings are densely covered with hairs. The under sides are similar to the upper, except that an indistinct undulating line runs along the margin of both wings.

As for the body that bears these lovely appendages, the thorax is white, sometimes yellowish or greenish, crossed by the purple-brown stripe that traverses the whole length of the upper edge of the front wings; the abdomen is of the same color as the thorax, and covered with white hairs like wool. The head is white and small, and adorned with wide, flat and strongly pectinated antennae of a brownish tinge. The legs are purple-brown.

Such is Luna in her various transformations to outward appearance; notwithstanding her size and loveliness, her habits and peculiar instincts are not very noteworthy. The gift of superior beauty, as among the highest of animals so in the insect world, is not frequently accompanied by remarkable intelligence or superior sense; and the most gaudy butterfly or moth is a fool in comparison with the dingy-colored bee. The caterpillars of butterflies and moths have some various instincts—chiefly in the direction of silk spinning and sepulchre building—but the perfect insects only live "to increase and multiply their race, and embellish nature. Their existence in the perfect state is usually very brief; it is one of the prettiest of honeymoons, and often love subdues and destroys every other passion. The gourmandizing caterpillar is never troubled by the ardent flame which consumes even the thought of sipping the nectar of the flowers that rival in beauty the wings of the perfect representation of elegance and love. The early insect lives and eats, and the perfect form lives and dies."

DESCRIPTION OF A NEW CALIFORNIAN AGROTIS.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

Agrotis observabilis, n. s.

♀. Fore tibiae unarmed; middle and hind tibiae spinose. By the flattened abdomen allied to *cupidissima*. Fore wings dark blackish brown, with the terminal space paler, somewhat olivaceous. As in *exsertistigma*, the orbicular is open, triangulate, broadly pale margined, fusing superiorly with a pale subcostal shade extending from the base of the wing above this spot. Unlike *exsertistigma*, the orbicular and reniform are black, the ground color of the median space about them being powdered with deep yellow. A black basal dash before the geminate, waved, t. a. line; the latter interrupted by the subcostal shade and with an interior pale shading. Claviform moderate, pale-edged. T. p. geminate, the inner line scalloped, the outer even, enclosing a rather broad pale space; the line is very slightly sinuate, not depressed opposite the cell. Subterminal line nearly straight, dark, with a very pale powdery exterior shade. Subterminal space darker shaded on costa, relieving the costal dots distinctly. Terminal line dentate. Hind wings dark fuscous with pale interlined fringes. Beneath quite pale, faintly ruddy and subirrorate, with common exterior line fading towards internal margins and discal marks. Collar pale, edged behind with black; tegulae blackish. *Expanse* 35 m. m. Hab. California (Behrens, No. 376.)

TINEINA FROM CANADA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from p. 128.)

Argyresthia Goedartella Auct.

This beautiful and well known European insect is now for the first time discovered in this country. I quote Mr. Stainton's description from *Ins. Brit., v. 3, p. 187*. "Head yellowish white. Face and palpi white. Antennæ white, annulate with fuscous. Anterior wings white, sometimes suffused with golden, with an oblique golden fascia from the base of the

costa; a golden fascia in the middle, furcate on the costa, one arm reaching the costa before the middle, the other a little before the apex; between them are generally a few golden spots on the costa; *beyond is another golden fascia, which, indeed, occupies the whole apex except a small white spot on each margin. Ciliæ pale grayish brown.*" (The italics are mine.) " Posterior wing gray with paler ciliæ. (The anterior wings are sometimes so much suffused with pale golden that the markings are almost obliterated.) Common among Birches in June and July. The larva feeds under the bark and in the young shoots of the Birch in March and April. *Al. ex.* 6 lines."

The single specimen before me is silvery white and the fasciæ are brown, golden, or topaz red with golden, according to the direction of the light. In lieu of that part of Mr. Stainton's description which I have italicised, I would say that in the apical part of the wing is an oblique broad fascia, nearest to the apex on the costal margin, where it contains a white streak, and it sends a branch to the dorsal ciliae so as to enclose a white spot at their base. Behind this fascia a narrow curved white one crosses the wing, and at the apex is a golden spot. It is a more handsome species than *A. andereggiella*, next after which as to beauty I would place *A. visaliella* Cham. *A. undulatella* Cham. and *A. Belangerella*, described below, are plain species.

The following are new species :

Argyresthia Belangerella. N. sp.

Head, antennae and palpi white, except that the antennae are annulate with dark brown and the face is a little suffused with yellow. Thorax on top and dorsal margin of the wings beneath the fold white, extending nearly to the tip. The other portions of the wings and sides of the thorax above them grayish brown. The grayish brown hue crosses the fold a little in the basal part of the wing, and the white crosses it a little at the base of the dorsal ciliae. There is a distinct dark brown dorsal spot just beyond the middle, but it does not entirely interrupt or cross the white part, and there are two smaller brown spots on the fold, near to and just behind it. There is also a somewhat indistinct brown spot about the middle of the costal margin, behind which and extending to the apex, at the base of the costal ciliae, is a row of alternate white and dark brown spots, and there are two brown spots within the dorsal ciliae in that part of the white which crosses the fold as above stated

There are also a few small white spots near the apex. Ciliae grayish streaked at the apex with brown. Legs yellowish white, the anterior pair brown on their anterior surfaces. *Al. ex.* ½ inch. Its nearest known American congener is *A. undulatella* Cham., but it is closely related to such European species as *A. spiniella* Zell. This collection also contains another species, marked No. 54, but too much injured to be recognized or described.

Bucculatrix Canadensisella. N. sp.

The ornamentation of this species differs from that of any other yet found in this country, and though allied to *B. cidarella* of Europe, it is still quite distinct.

Head white. Tuft tipped with dark reddish brown, and the face faintly tinged with purplish fuscous. Upper surface of the thorax brown margined all around by white. Base of the fore wings white, followed by an oblique brown fascia, which is nearest the base on the costal margin, and is followed by an oblique parallel white fascia; all of these are placed before the middle and are followed by a large brown patch which occupies the entire wing to the ciliae, except that it contains a white spot on the middle of the costal margin. The brown patch is margined before on the dorsal margin of the wing by a small tuft of raised brown scales. At the beginning of the dorsal ciliae is a white spot placed a little before, but becomes almost confluent with a longer white costal streak. Behind these streaks to the apex the wing is pale brown, with a darker velvety brown apical spot. Ciliae pale yellowish, with a dark brown hinder marginal line before their middle, not extending into the costal ciliae. Hind wings pale fuscous. *Al. ex.* ⅜ inch.

Gracilaria pulchella. N. sp.

The palpi in the single specimen of this species in the collection are broken off. Antennae dusky yellow, faintly annulate with brown. Head yellowish, with faint violet reflections. There is no trace of the costal triangle, nor, indeed, of any markings on the fore wings, which, and the thorax, are reddish yellow, or perhaps, more properly, are very pale or yellowish brick red, with strong violet and purple reflections, especially towards the apex of the fore wings. Hind wings grayish fuscous; abdomen grayish fuscous, with the tip pale yellow. Tarsi of the 1st and 2nd pairs of legs white, with the 1st pair of legs brownish red. The under surface of the thorax and the 2nd and 3rd pairs of legs dark gray, with the tibiae and tarsi of the 3rd pair yellowish. *Al. ex.* ½ inch.

Elachista unifasciella. N. sp.

Antennae brownish purple ; palpi white. Head, thorax and fore wings brownish purple, in some lights reddish purple. There is an oblique white fascia just before the middle of the fore wings, which is a little nearer the base on the costal than on the dorsal margin, and the color of the wing is much deeper behind the wing than before it. There is a small white spot just before the dorsal ciliae, and a little behind it is a narrow costal white streak, which passes obliquely backwards nearly across the wing. The legs and tarsi are marked with brownish purple and yellowish white bands and spots. *Al. ex.* ¼ inch. The white markings on the wings are metallic in some lights. I think it is not likely to be mistaken for any known species.

Anarsia? albapulvella. N. sp.

I have but a single specimen of this species, and have not examined the neuration. Possibly it belongs to *Ypsolophus*, to which it is allied by the ciliation of the antennae, apparent under the lens. But the ornamentation is unlike that of any *Ypsolophus* known to me, and the width and form of the wings and form of the palpi ally it to *Anarsia* rather than to *Ypsolophus*. The checkered ornamentation of the antennae reminds one of a *Plutella*.

Antennae dark brown, with a white spot on each side of each joint. Palpi dark brown, the tuft tipped with white, with a white line on each side of each joint. Tongue white. Head grayish brown. Fore wings and thorax brown, the wings sparsely but distinctly dusted with white, especially towards the apex, where there is a white dusted fascia which is strongly angulated posteriorly, following the course of the apical margin and connecting a small ochreous spot at the beginning of the costal ciliae with one at the beginning of the dorsal ciliae ; there are six transversely oblique oblong narrow white spots around the base of the ciliae, two of them being on the costal and four on the dorsal margin. Ciliae ochreous. Posterior wings gray, with whitish ciliae. Legs and tarsi dark brown, the tarsi annulate with white. *Al. ex.* ⅜ inch.

ON TWO NEW SPECIES OF HOMOPTERA.

BY H. K. MORRISON, CAMBRIDGE, MASS.

Homoptera uniformis, nov. sp.

Expanse 40 m. m. Length of body, 18 m. m.

Palpi long and slender, the second joint light and contrasting, the third dark, tipped with light. Thorax as usual in the genus. Abdomen cylindrical, with slight white dorsal tufts. Anterior wings uniform dull gray-brown, sprinkled with black atoms; the usual black clear-cut transverse lines are obsolete, the subterminal line only is seen as a black diffuse shade crossing the wings; some basal black markings; ordinary spots black, very distinct, close together; the orbicular a round spot, the reniform a sublunate black mark; a series of black dots before the concolorous fringe.

Posterior wings concolorous with the anteriors, having the same diffuse subterminal band, which, however, becomes condensed into a black spot at the anal angle. Beneath gray, concolorous, without lines; distinct black discal dots and a series of bicolorous white and black dots before the fringe.

Hab. Georgia.

Received from my friend, Mr. George W. Peck, of Brooklyn. The absence of the usual markings will distinguish this species, which does not differ structurally from the other *Homopteræ*.

Homoptera cinerea, nov. sp.

Expanse, 45 m. m. Length of body, 20 m. m.

Palpi gray, of normal form. Collar, thorax and abdomen cinereous black. Pterygodes well marked. Abdomen strongly tufted, the two anal segments ochreous, very distinctly so beneath. Both wings shining, cinereous, on a black ground; the outer half of the wings have a slight purple tinge in certain lights; orbicular spot a black dot; median shade well marked, angulate on the median vein, followed by a blackish, less cinereous shade; exterior line black, indistinct, preceded by a cinereous shade line, twice angulate opposite the brown diffuse reniform spot; subterminal line distinct inferiorly only; a yellow brown shade along the costa of the posterior wings; the disk of the wings is occupied by

alternating cinereous and blackish shades, the former predominating ; one distinct black median line, preceded by a blackish shade. Beneath uniform cinereous gray, discal dots not prominent.

Hab. Massachusetts.

The beautiful cinereous and black coloration of this fine species will at once separate it.

NOTES ON THE LIFE HISTORY OF THE AMERICAN TIGER MOTH.

BY ROBERT BUNKER, ROCHESTER, N.Y.

Arctia Americana.

Egg spherical, .04 inch in diameter, honey yellow, shiny and smooth as polished glass ; laid in straight rows. Larva, when first hatched, one-eighth of an inch long, head small and black, body dark brown clothed with ten longitudinal rows of bunches of spreading hairs ; dark brown on the sides, dark gray on the back. First moult somewhat increased in size, color unchanged. Second moult ⅜ inch long, dark sooty brown ; hair dark brown on the sides, grayish brown above. Third moult ¾ inch long ; hair on the sides and fore part above, reddish brown ; light gray on the back.

Hybernated Sept. 16th. June 1st, 1875, fourth moult ; 1¼ inches long ; body blackish brown, sides and fore part above clothed with ochre yellow, back with long bluish gray hairs. Fifth moult—body two inches long, velvety black, ornamented above with four rows of very long bluish gray hairs (directed backwards) ; in front and on the sides with dark yellowish-red hair, except the third row, which is made up of about equal parts of red and gray hairs ; hairs immediately back of the head short and directed forward. Spiracles yellowish white, with a waxy lustre. Feet dark, snuff brown.

Cocoon thin and loosely put together, with hair from the body woven in.

Three specimens of this rare species were captured here last season. The one that came into my possession was brought by a friend, and laid about fifty eggs while in the box. With all the care I could bestow upon them only two reached maturity. A large majority perished during hybernation. Several sickened and died after the last moult; probably in a state of nature not more than two per cent would reach the imago state.

NOTES ON BUTTERFLIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

I am able to complete the history of *M. phaeton*, part of which I communicated to the CAN. ENT. in Jan'y, 1869, vol. 1, p. 59.

The eggs are laid in large clusters of from 200 to 400 each, upon the under side of leaves of *Chelone glabra*. They are sub-conical, truncated, ribbed on upper half, yellow when laid, but soon turn to crimson. In 19 or 20 days, as Mr. Scudder informs me, they hatch. As the eggs found by me (13th June) had been deposited some days, I could not verify that point. The young larvae at once begin to construct a web, usually on the topmost leaves of the stem, and feed on the green leaves enclosed; as these are consumed, the web is extended down the stem, covering fresh leaves. The first moult takes place at six days, and the second at about the same time from the first. The third at a further interval of nine to ten days. Between the first and third the larvæ live much outside of the web, but the moult takes place within. Before the third moult a substantial web is constructed, and after the larvae have passed this moult, they become lethargic, and so remain till early the following spring. This period of lethargy commences, at this place, about the 15th of July. The web last constructed is often upon a different plant from that on which the larvæ feed, and in nearly all cases is supported by adjoining stems being incorporated.

With the first warm days of April the larvæ leave the web and scatter about the swamp in search of the young stems of *Chelone*. They moult twice and reach maturity about the 5th of May. The chrysalis period is

from 14 to 18 days. I have found no evidence that these larvæ feed on any other plant than *Chelone glabra*, though, as I have said, the webs are built on other plants.

Phyciodes nycteis Doubleday.

I have sometimes confounded this species with *P. Harrisii*, and I see that in vol. iv, CAN. ENT., p. 237, I made this error. The larvæ of *nycteis* feed on *Actinomeris squarrosa*, as was correctly stated by me in vol. v, p. 224. I then described the fall brood of *nycteis*, all of which hybernated after the third moult, and revived the following spring. This season I have raised an early brood from the eggs, and about one-third of the larvæ went on to chrysalis, while the remainder became lethargic after the third moult.

The chrysalis of this species varies much. Some are light-coloured, nearly white, with delicate blackish spots and fine streaks of brown over the surface; others are almost wholly black, while others again are between the two extremes. The length of the chrysalis is one-half inch, and the shape very nearly that of *phaeton*.

Argynnis idalia.

Mr. G. M. Dodge sent me last fall, from Nebraska, several eggs of this species, and I succeeded in carrying a few of the larvae through the winter, and one of them past the fifth moult, but this one died before chrysalis. The eggs are congeneric in shape with those of *cybele*, *aphrodite* and *diana*, and the larvae are of the same character as in those species. In the first two stages the larvae, indeed, are scarcely distinguishable in any respect from those of *diana*. After this, instead of the color being black or brown, as in the three species named, they are prettily ornamented with light stripes ; but the spines and the arrangement of them are just as in the others. The food plant was common violet, or cultivated violets or pansies, indifferently. I raised quite a number of larvae of *cybele* last winter, and with perfect success. Instead of enclosing them in glasses, a process which proved disastrous to the *Argynnis* larvae which I attempted to raise in '73–'74, I covered the plants with wire gauze cylinders. These admitted plenty of air, and I had only to see that fresh leaves were supplied.

LIST OF NEUROPTERA COLLECTED CHIEFLY IN THE NEIGHBOURHOOD OF LONDON, ONT.

BY THE EDITOR.

All the species named below have been submitted to Dr. H. Hagen, of Cambridge, Mass., to whose kindness we are indebted for the determination of most of them.

PERLINA.

Perla rapinsularis.
" species undetermined.
Chloroperla bilineata.
Taeniopteryx maura ?

EPHEMERINA.

Ephemera natata ; very common.
Potamanthus cupidus; not uncommon.
Hexagina bilineata.

AGRIONINA.

Calopteryx maculata ; common about damp woods in the neighbourhood of small streams.
Lestes disjuncta ? ; not uncommon.
Agrion irene ; common.

GOMPHINA.

Ophiogomphus rupinsularis ; not common.
Gomphus spicatus ; not common.
Cordulegaster maculatus.

AESCHINA.

Aeschna constricta.
" verticalis.
" vinosa.

LIBELLULINA.

Celithemis eliza ; rare.
Plathemis trimaculata ; common.
Libellula quadrimaculata ; rare.
" exusta ; rare.
" pulchella.
" basalis ; rare.
" julia.

Leucorhinia frigida ; not common.
" intacta ; not common.
Diplax obtrusa ; common.
" vicina ; not uncommon.
" scotica.
Nannophya bella ; common.

SIALINA.

Sialis infumata.
Chauliodes pectinicornis ; not uncommon.
" serricornis ; rare.
Corydalis cornuta ; not uncommon.

HEMEROBINA.

Hemerobius tutatrix.
" simulans.
Polystoechotes punctatus ; very common.
Chrysopa oculata.
" externa ?

PHRYGANINA.

Neuronia ocelligera ; not common.
" postica ; not common.
Limnophilus stigma.
Setodes ; spec. und.
Hydropsyche scalaris ?

In addition to the above, Dr. Hagen has kindly supplied us with the following list of species found in Canada.

Ophiogomphus colubrinus ; Quebec.
Gomphus parvulus ; Nova Scotia.
Hagenius brevistylus ; Ottawa.
Cordulegaster Sayi ; Quebec.
Aeschna septentrionalis ; Nova Scotia.
Epophthalmia tenebrosa ; Nova Scotia.
" elongata ; Nova Scotia.
" torripata ; Nova Scotia.
Cordulia libera ; Canada.
" Shurtleffii ; Nova Scotia.
" spinigera ; Canada.
" semiaguea ; Nova Scotia.

Leucorhinia Hudsonica; New Brunswick.

Aeschna constricta, recorded in the Ontario list, is also found in Nova Scotia.

The above brief list of 43 species from Ontario and 13 from other portions of Canada, embraces, we believe, all that are known to occur in our Dominion. In view of the great number of insects belonging to this interesting order which occur throughout Canada, we hope that some of our collectors will devote a portion of their leisure moments towards more thoroughly working up this long neglected order of insects.

DESCRIPTION OF PACHNOBIA ORILLIANA.

BY AUG. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

Both sexes of a species of *Pachnobia* have been collected by Mr. Geo. Norman, at Orillia, which I propose to call by the name of *orilliana*. It is evidently allied to *Agrotis hyperborea*, which I know only from Milliére's and Herrich-Schaeffer's illustrations. It looks at first sight like a species of *Graphiphora (Taeniocampa)*.

All the tibiae are spinose. The head is sunken, eyes naked, abdomen short. The wings are wide, the male antennae shortly pectinate, setose. The color is not unlike that of *Graph. incerta*, but more olivaceous. There is no basal dash. The color is paler, carneous gray, like the thorax, to the angulated median shade, beyond which the median space is olivaceous brown. The orbicular is large, spherical, concolorous, with a central brown dot and a brown ring. The claviform is suffused with deep brown, prominent, attaining the median shade. The reniform lies in the deeper color of the median space posteriorly, concolorous, kidney-shaped, darker stained inferiorly, well sized. The t. a. line is outwardly oblique, thrice waved, brown. The t. p. line is obsoletely geminate, the pale interior shade showing, of the usual shape, succeeded by a pale shading on the subterminal space which intrudes on the deep brown ground color outwardly like a finger below costal region. The deep brown color of the s. t. space shows the costal dots plainly and extends downwardly narrowly within and along the s. t. line, outside of the pale

shade which follows the t. p. line. S. t. line whitish gray, broad, distinct, with a subcostal dentation else continuous and even. Terminal space blackish; broken black points indicate the terminal line. Fringes reddish brown. All the veins marked by blackish scales, and there is a blackish shading over the median space anteriorly, below median vein and on the inferior portion of the basal field. The male has the lines and spots less obvious and the shading of the wing more strongly contrasts. Hind wings with reddish brown fringes, shaded with fuscous and with a blackish exterior shade and faint median line. Beneath the wings are irrorate with rufous; on both pair the terminal spaces are contrasted by a whitish coloring. A common subterminal shade and exterior line; discal marks linear, luniform. Beneath the vestiture is reddish brown, as are the sides of the palpi; above, with the front, these latter are pale. *Expanse* 35 m. m.

In the male the conformation of the subterminal pale shading is indistinct; the blackish shading basally on interior margin is restricted, the claviform is shorter, not attaining the median shade; the dark olive brown tint of the s. t. space forms a spot along the s. t. line opposite the cell. In this species the form of the thorax, which is darker colored posteriorly, recalls that in *Lithophane.*

Lederer only gives armature to the middle and hind tibiae in his diagnosis of *Pachnobia.* *P. carnea*, the type, has all the tibiae spinose; so has *Pachn. scropulana (Agrotis scropulana* Morr.) The species have the habitus of *Graphiphora (Taeniocampa).* I find that none of the characters given by Mr. Morrison in a recent number of *Psyche*, to distinguish his *Agrotis scropulana*, are valid, except that of the basal markings of the primaries, to which I am the first to draw attention. I am therefore still of the opinion that it is not certain that the White Mountain species is really different. I have recently re-examined my type of *Matuta Catharina.* I believe it to be a female; the simple antennae may not distinguish it from *Pachnobia* in this event, but it is different by the unarmed fore tibiae. It has a resemblance to *Pachn. orilliana* in habit and the black stains on the veins. Our North American species of *Pachnobia* will be as follows:

Cornuta Grote,
Scropulana (Morr.)
(An spec. seq. ?)
Carnea (Thunb.)
Orilliana Grote.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana : Insecta.

(Continued from Vol. vii, p. 113.)

COLEOPTERA.

By an unfortunate oversight, descriptions of the following Coleoptera have been ommitted. They should have preceded the family Cleridae on p. 109 of the present volume. In the reprint which we are preparing they will appear in their proper place.—ED. C. E.

[240.] FAMILY DIRCÆIDÆ.

326. XYLITA BUPRESTOIDES *Payk.*—Length of body 3 lines. Taken in Canada by Dr. Bigsby.

Body narrow, black-brown, very minutely and thickly punctured, sprinkled with short decumbent pale hairs, not glossy. Head inserted; eyes hemispherical; palpi rufous; antennae nearly as long as the prothorax, ferruginous, a little embrowned at the apex; prothorax not wider than long, anteriorly narrowest, posteriorly obsoletely trilobed; sides rounded; scutellum transverse; elytra very little wider than the prothorax; tarsi ferruginous.

[Taken by Agassiz's Expedition to Lake Superior.]

FAMILY ANTHICIDAE.

327. NOTOXUS MONODON *Fabr.*—Length of body 1⅔ line. A single specimen taken in Lat. 65°.

[241.] Body hairy with pale hairs. Head blackish; mouth, palpi, and antennae testaceous; prothorax testaceous; horn convex above, margin denticulated; elytra testaceous with a blackish band near the apex which rises upwards at the suture, and three blackish spots; two at the base, and one between the band and the apex, the last very faint; legs testaceous; postpectus and base of the abdomen embrowned; the remainder of the prone part of the body is testaceous.

[Not uncommon in Canada. Described and figured by Say (Am. Ent., i, 21, plate 10).]

FAMILY CANTHARIDAE.

328. CANTHARIS UNICOLOR *Kirby*.—Length of body 7 lines. Taken in Canada by Dr. Bigsby.

Body black, hoary from numerous decumbent white hairs; antennae subsetaceous, a little longer than the prothorax; two first joints very long, the first curved and nearly twice the length of the second; and the second as long as the three following ones together; prothorax rather bell-shaped, channelled; wings embrowned.

[Belongs to the genus *Epicauta* Red.]

[242.] 329. MELOE IMPRESSA *Kirby*.—Length of body 5¼ lines. A single specimen taken in Lat. 65°.

Nearly related to *Meloe violacea*, but very much smaller. Body violet-coloured. Head with scattered but not large punctures; front between the antennae transversely and obtusely elevated; antennae irregular; prothorax not much narrower than the head, anteriorly rounded, posteriorly narrower and emarginate, towards the base with a deepish impression, with several scattered but not large punctures, and two little transverse oblique crescents formed of punctures; elytra wrinkled; outer claws and spurs rufo-piceous, inner claws paler.

330. MELOE NIGRA *Kirby*.—Length of body 6 lines. A single specimen taken in Lat. 65°.

Extremely similar to the preceding species, but the body is all black with no tint of violet, except the base of the antennae below the band and the tibiae and tarsi; the head and prothorax are more thickly punctured, and the claws and spurs are ferruginous.

[Previously described as *M. conferta* Say.]

[243.] FAMILY MELYRIDÆ.

331. DASYTES FOVEICOLLIS *Kirby*.—Length of body 2¾ lines. A single specimen taken in the Journey from New York to Cumberland-house.

Body somewhat hairy, underneath black and glossy; above with a blue tint. Head glossy, punctured with largish scattered punctures; front with two impressions; prothorax nearly square, with the sides a little curved, punctured at the head, with a pair of transverse anterior impres-

sions; sides and base margined, margin reflexed; elytra less glossy than the rest of the body, minutely, but not conspicuously, punctured.

[Belongs to the family *Malachiidæ*.]

[254.] V.—HYMENOPTERA.

FAMILY CIMBICIDÆ.

351. CIMBEX FEMORATA *Linn.*—Length of body 10 lines; expansion of wings 21 lines. A single specimen taken in Lat. 65°.

♀. Body very black, hairy. Antennæ yellow, brown at the base; legs blue-black; tarsi yellow; wings hyaline with yellow nervures, brown at the tip, with a brown cloud in the middle areolet adjoining the costa.

352. TRICHIOSOMA TRIANGULUM *Kirby.*—Length of body 9 lines. A single specimen taken in Lat. 65°. Another was also sent me from Canada by Dr. Bigsby.

[255.] Body black, shining, covered with soft and woolly whitish hairs, punctured more or less. Head, excluding the mandibles, depressed, orbicular, as wide as the trunk; mandibles crossed, very sharp, black; upper lip subpentagonal, flat with a longitudinal elevation in the middle, hairs on this part black; anterior margin of the nose wavy, emarginate in the middle; antennæ with the fourth, fifth, and sixth joints testaceous; three eyelets behind the antennæ arranged in a triangle; eyes oval, prominent; vertex square, marked out by a ridge on each side; trunk subglobose; prothorax with a longitudinal furrow; thighs and coxae black-blue; under a strong magnifier beautifully and most minutely reticulated, which gives them a silky lustre; the rest of the leg is testaceous; the two posterior pair of thighs are thicker than the others and armed at the apex with a short tooth on each side, between which is a cavity to receive the shank when folded; tarsi with a sucker underneath at the apex of the four first joints; wings testaceous with piceous nervures, and a cloud at the tip; abdomen ferruginous with a dorsal triangular black spot, extending from the base towards the apex, but not entering the last segment; the basilar ventral segments are spotted with brown.

[Found in Canada and Colorado.]

353. TRICHIOSOMA LUCORUM *Linn.*—Length of body 7 lines; expansion of wings 15 lines. A single specimen taken in Lat. 65°.

Body black with a very slight æneous tint; glossy, hairy with cinerascent hairs, those of the trunk long. Head orbicular, scarcely so wide as the trunk; upper lip small, convex, orbicular, punctured; antennae black; wings subhyaline with a cloud at the tip; nervures some piceous and others rufous; thighs black with a very slight tint of blue; posterior pair armed with a tooth; abdomen short, subovate, black, covered more or less with short decumbent down; black above, underneath reddish at the tail.

[256.] FAMILY TENTHREDINIDÆ.

354. ALLANTUS LEUCOSTOMA *Kirby*.—Length of body 6 lines. One specimen taken in Lat. 65°.

Body narrow, black, glossy, without hairs. Head scarcely so wide as the trunk, wedge-shaped; palpi, suborbicular upper lip, emarginate nose, and base of the mandibles, white; apex of the latter rufous; antennae a little shorter than the trunk, nine-jointed, with the third joint longer than any of the others; neck constricted; tegulae testaceous; wings subhyaline with piceous nervures; legs yellow, with the apex of the tibiae and the whole of the tarsi of the posterior legs, black; abdomen linear, acute at the anus.

This species comes near *Allantus ater*, but the mandibles are rufous at the apex; the palpi are whiter; and the legs of a different colour.

FAMILY SIRICIDÆ.

355. SIREX BIZONATUS *Stephens*.—Length of body 18 lines; expansion of wings 27 lines. Taken in Lat. 65° and in the journey from New York.

[257.] Body very black, covered with innumerable punctures from each of which proceeds a black upright hair. Head narrower than the trunk; mandibles incumbent; palpi rufo-piceous; antennae as long as the trunk, yellow; behind each eye is a large oval yellow eye-like spot perfectly naked and smooth; legs and tips of the thighs yellow; wings yellowish with dark nervures; abdomen with the second, seventh and eighth segments luteous; anal mucro linear, yellow, terminating in a point; ovipositor black.

The specimens of this species, which Mr. Stephens found near London, might probably have been imported in fir timber from Canada.

DESCRIPTION OF A NEW SPECIES OF ANNAPHILA FROM CALIFORNIA.

BY LEON F. HARVEY, M. D., BUFFALO, N. Y.

Annaphila immerens, n. s.

This is perhaps the slightest species of the genus yet known.

The blackish gray fore wings show the median line distinctly; the t. p. line is incepted nearer the apex than usual, denticulate, slightly rounded opposite the cell, and unusually strongly inflected below the black mark, which denotes the reniform spot. The orbicular is a black dot. The t. p. line is bordered outwardly with a pale shade. Hind wings deep orange yellow, without dot or median line; the latter obsoletely indicated at internal margin. A very narrow terminal black line, inwardly dentate above submedian fold; fringes fuscous. Beneath orange yellow, immaculate, with narrow even blackish edging and fuscous fringes. On primaries costal traces of a transverse line. Body blackish fuscous.

Exp. 20 m. m. *Hab.* California.

BOOK NOTICES.

The Butterflies of North America, by W. H. Edwards, second series, part 3.

The third part of the second series of this superb work has reached us since our last issue. It contains five magnificent plates, figuring *Papilio zoliacon, Argynnis Meadii, Apatura celtis,* with drawings of the egg and of the larva in its various stages; *Chionobas gigas* and *Californica,* and *Lycæna regia* and *heteronea,* with accompanying descriptions and much interesting information regarding the habits of the species.

Description of a new Crustacean from the Water Lime Group at Buffalo, by Aug. R. Grote and W. H. Pitt.

We have received advanced sheets of this paper, accompanied by an excellent photograph of the interesting object of which it treats. Both will appear in No. 1, Vol. 3 of the Bulletin of the Buffalo Society of Natural Sciences.

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NOTES UPON SOME BUTTERFLY EGGS AND LARVÆ.

BY THEODORE L. MEAD, NEW YORK.

During the past month (July) I have endeavored to obtain the eggs and larvæ of some of the butterflies common near this place (Hunter), in the Catskill Mountains, and have met with considerable success.

The most interesting discovery was that of the food plant of *Phyciodes tharos*, which had baffled all my endeavors for the past four or five years, during which time Mr. Edwards and myself have tried a great number of plants without avail.

Once, indeed, as has been recorded in a previous volume, we obtained a number of eggs from females enclosed in a glass jar with grass, but the larvæ refused to feed and died.

This summer, remembering that the congeneric *nycteis* and *Harrisii* feed on Compositæ, I prepared a large box by partly filling it with earth and transplanting into this small specimens of all the common Compositæ I could lay my hands upon. The box was covered with gauze and about a dozen ♀ *Phyciodes marcia* and *tharos* introduced. In a few days I examined the leaves and found six patches of eggs upon one of the plants, the number of eggs in a patch varying from twenty to about one hundred and fifty. The plant proved to be a species of Aster, very common here in wet places and by the roadside; no specimens are in bloom as yet (Aug. 2nd), but from the leaves I think it will prove to be *Aster Novæ-Angliæ*. No eggs were found on any of the other plants. After finding these, I transferred the females of *marcia* which still remained alive to a smaller box with living food-plants; these have now laid several more large patches of eggs.

On the 31st of July I succeeded in finding a brood of young caterpillars upon a plant of this Aster growing in a damp meadow. The larvæ feed upon the under side of the leaf in the same way as those of *nycteis*, leaving the upper surface untouched. Those of the first moult

are merely hairy, in the second moult the spines are already distinctly seen. Around one cluster of the larvæ a green spider had drawn his net and taken up his abode among them, no doubt finding it very convenient to have his prey within such easy reach. Probably the ravages of spiders are more destructive to this species than almost any other cause, since the eggs are deposited near the ground, in places where spiders are always very numerous.

Mr. Edwards also has females of *Ph. marcia* set for eggs, and hopes to determine the relationship, if any, between this species and *tharos*.

In obtaining eggs of *Limenitis arthemis* I have also been very successful, partly, I think, on account of a method of keeping the parent butterflies in good health and spirits, devised some years ago, and which has given very satisfactory results.

A notch is cut in the side of any empty wooden box, through which a branch of willow or other appropriate food-plant is passed, care being taken to select a leafy spray so as to partially fill the box with foliage; it is then covered with gauze, tacked fast on one side and part way on the adjoining sides, that on the fourth side being held down by a piece of wood fastened to the remaining flap of gauze. This renders easy the examination of the contents at any time. Now a saucer of raw dried apples, sugared and partly filled with water, is put in and the cage is complete. Butterflies like *L. arthemis* will live in such a vivarium for two weeks and more after their capture, and appear to enjoy the food provided immensely, laying many more eggs than if enclosed in a bag and allowed to perish of hunger and thirst.

I have often captured specimens and dropped them in upon the pile of dried apples; instead of fluttering about and endeavoring to escape, they instantly unrolled their tongues and feasted for several minutes upon the repast prepared for them, without a motion of the wings.

So far, my fifteen females of *L. arthemis* have laid a very large number of eggs, probably over five hundred, and many of them are still alive. The butterflies at first observe their usual custom of depositing the eggs upon the tips of the leaves, but become reckless after a while and lay them anywhere. I counted considerably over one hundred upon the cloth covering the box.

I had the rare good fortune to catch also a female of *L. proserpina*, which has laid 31 eggs.

By next summer Mr. Edwards and myself hope to settle the question as to the dimorphism of *L. arthemis*, by rearing the caterpillars from these eggs ; as about one-twentieth of the specimens seen are *proserpina*, if we are reasonably successful in carrying them through the winter, we are sure to obtain both forms from each kind of parent, if this is really a case of dimorphism.

Two years ago I captured a specimen here, intermediate in marking between *arthemis* and *proserpina*, and this year I have taken another, but these varieties are exceedingly rare.

The period between the laying and hatching of the egg is about seven days ; the young larva, as has been observed with other species of *Limenitis*, makes its way to the tip of the leaf and there eats on both sides of the midrib, usually resting on the projecting end of this. On my box I notice that where two larvæ are hatched upon one leaf, the second comer constructs a narrow perch for himself from the side of the leaf, and rests upon it. These perches are nearly a quarter of an inch long and about one-fiftieth of an inch in diameter ; they are irregularly cylindrical, and composed of frass and small bits of the leaf, fastened together and covered with grayish silk.

Besides these eggs I have many of *Satyrus nephele*, and obtained a few of a small species of *Nisoniades*. The parent was too much battered and broken to be surely identified, but I believe it to be *lucilius*. The eggs were deposited on willow ; they are oval and have ten strongly projecting upright ribs, these and the space between them being marked with transverse raised lines. In color the eggs are yellow, soon changing to claret-red. The young larva, soon after hatching, eats a narrow slit from the edge of the leaf inward, soon turning at an angle, and then the flap of leaf is bent over and fastened with silken cables so as to afford shelter to the caterpillar. I have sometimes found, in previous seasons, half grown larvæ of some Hesperian on the poplars and willows here, hiding between two leaves lightly fastened together, and probably this is the habit of the species in question as it grows up.

———:o:———

PIERIS RAPÆ.—This troublesome pest to the cabbage grower is rapidly spreading westward. During the past month (August) it has appeared in considerable numbers in this neighbourhood (London, Ont.,) and is fast becoming one of our commonest butterflies. Already reports are coming in from all quarters of damage done by the larvae. We hope its little parasite, *Pteromalus puparum*, will soon follow in its wake.—ED. C. E.

THE EFFECT OF THE GLACIAL EPOCH UPON THE DISTRIBUTION OF INSECTS IN NORTH AMERICA.

BY AUG. R. GROTE, A. M.

(Read before the American Association for the Advancement of Science, at Detroit, Aug. 10th.)

From the condition of an hypothesis the glacial epoch has been elevated into that of a theory by the explanations it has afforded to a certain class of geological phenomena. The present paper endeavors to show that certain zoological facts are consistent with the presence, during past times, of a vast progressive field of ice, which, in its movement from north to south, gradually extended over large portions of the North American continent. These facts, in the present instance, are furnished by a study of our Lepidoptera, or certain kinds of butterflies and moths now inhabiting the United States and adjacent territories. Before proceeding with the subject, a brief statement of phenomena, assumed to have attended the advent of the glacial epoch, is necessary.

At the close of the Tertiary, the temperature of the earth's surface underwent a gradual change by a continuous loss of heat. The winters became longer, the summers shorter. The tops of granitic mountains in the east and west of the North American continent, now in summer time bare of snow and harboring a scanty flora and fauna, became, summer and winter, covered with congealed deposits. In time the mountain snows consolidated into glacial ice, which flowed down the ravines into the valleys. Meanwhile the northern regions of the continent, which may have inaugurated, submitted extendedly to the same phenomena. Glacial ice, first made on elevations, finally formed at, and poured over, lower levels. Glacial streams finally united to form an icy sea, whose frozen waters slowly plowed the surface of the rocks, and whose waves, in their movement from north to south, absorbed the local glacial streams in their course, and extended over all physical barriers into the Southern States and down the valley of the Mississippi. Before this frozen deluge the animals must always have retreated. The existing insects of the Pliocene must, in submitting to the change of climate which accompanied the advance of the glacier, have quitted their haunts with reluctance, and undergone a severe struggle for existence, no matter how gradually they

had been prepared for the encounter. We may expect that multitudes of specific forms ultimately perished, of whose remains no traces have been preserved.

Such being a brief statement of the outlines of the opening of the glacial epoch, we turn to some facts offered by a study of certain of our existing species of butterflies and moths.

The tops of the White Mountains and the ranges of mountain elevations in Colorado, offer us particular kinds of insects, living in an isolated manner at the present day and confined to their respective localities. In order to find insects like them we have to explore the plains of Labrador and the northern portion of the North American continent, in regions offering analogous conditions of climate to those obtaining on the summits of these mountains. The genera *Oeneis* and *Brenthis* among the Butterflies, and *Anarta* and *Agrotis* among the Moths are represented by the same or similar species in all of the above mentioned localities. In the case of the White Mountain butterfly, *Oeneis semidea*, we have a form sustaining itself on a very limited Alpine area on the top of Mount Washington.* Although there is some doubt that precisely the same form of *Oeneis* has been discovered in Colorado, the fact remains that *Oeneis* butterflies exceedingly like it, though registered by us under different specific names, live in Labrador and Colorado. Whether the White Mountain butterfly, *Oeneis semidea*, be, as suspected by Lederer, a modification of some of the Labradorian forms of the genus, or not, the geographical distribution which its genus enjoys cannot be meaningless. The question comes up, with regard to the White Mountain butterfly, as to the manner in which this species of *Oeneis* attained its present restricted geographical area—How did the White Mountain butterfly get up the White Mountains? And it is this question that I am disposed to answer by the action attendant on the decline of the glacial epoch.

I have before briefly outlined the phenomena attendant on the advance of the ice-sheet, and I now dwell for a moment on the action which must equally be presumed to have accompanied its retirement. Many of the

* See Mr. Scudder's article in the "Geology of New Hampshire," 1, 342. Mr. Scudder first pointed out the existence of Alpine and sub-Alpine faunal belts on Mount Washington, and interestingly remarks, "that if the summit of Mount Washington were somewhat less than two thousand feet higher, it would reach the limit of perpetual snow."

features of its advance were repeated, in reverse order, on the subsidence of the main ice-sheet or glacial sea. The local glaciers appeared again, separate from the main body of ice, and filled the valleys and the mountain ravines, thus running at variance with the main body of the glacier, being determined by local topography. A reversal of the temperature shortened the winters and lengthened the summers. Ice-loving insects, such as our White Mountain butterfly, hung on the outskirts of the main ice-sheet, where they found their fitting conditions of temperature and food. The main ice-sheet had pushed them insensibly before it, and during the continuance of the glacial epoch, the geographical distribution of the genus *Oeneis* had been changed from a high northern region to one which may well have included portions of the Southern States. And, on its decline, the ice-sheet drew them back again after itself by easy stages ; yet not all of them. Some of these butterflies strayed by the way, delayed by the physical nature of the country and destined to plant colonies apart from their companions. When the main ice-sheet left the foot of the White Mountains, on its long march back to the pole, where it now seems to rest, some of these wayward, flitting, *Oeneis* butterflies were left behind. These had strayed up behind the *local* glaciers on Mount Washington and so became separate from the main body of their companions, which latter journeyed northward, following the course of the retirement of the main ice-sheet. They had found in elevation their congenial climate, and they have followed this gradually to the top of the mountain, which they have now attained and from which they cannot now retreat. Far off in Labrador the descendants of their ancestral companions fly over wide stretches of country, while they appear to be in prison on the top of a mountain. I conceive that in this way the mountains may generally have secured their alpine animals. The glacial epoch cannot strictly be said to have expired. It exists even now for high levels above the sea, while the Esquimaux finds it yet enduring in the far north. Had other conditions been favorable, we might now find Arctic man living on snow-capped mountains within the Temperate zone.

At a height of from 5,600 to 6,200 feet above the level of the sea, and a mean temperature of about 48 degrees during a short summer, the White Mountain butterflies *(Oeneis semidea)* yet enjoy a climate like that of Labrador within the limits of New Hampshire. And in the case of the moths an analogous state of things exists. The species *Anarta melanopa* is found on Mount Washington, the Rocky Mountains and Labrador. *Agrotis islandica* is found in Iceland, Labrador, the White Mountains, and, per-

haps, in Colorado. As on islands in the air, these insects have been left by the retiring of the ice-flood during the opening of the Quarternary.

On inferior elevations, as on Mount Katahdin, in Maine, where we now find no *Oeneis* butterflies, these may formerly have existed, succumbing to a climate gradually increasing in warmth from which they had no escape; while the original colonization, in the several instances, must have always greatly depended upon local topography.

In conclusion, I have briefly endeavored to show, that the present distribution of certain insects may have been brought about by the phenomena attendant on the glacial epoch. The discussion of matters connected with this theoretic period of the earth's history still, as it now appears, brings out more and more clearly the conception of its actuality. I hope that my present statements may draw the attention of our zoologists more to the matter, seeing that we have in our own country fields for its full exploration. And I permit myself to entertain the belief that testimony as to the former existence of a long and widely spread winter of the years, is offered in evidence through the frail, brown, *Oeneis* butterflies that live on the tops of the mountains.

METHODS OF SUBDUING INSECTS INJURIOUS TO AGRICULTURE.

BY JOHN L. LECONTE, M. D., PHILADELPHIA.

(Read before the American Association for the Advancement of Science, at Detroit, Aug. 10th.)

In accordance with the predictions made at the time of its first appearance in the immediate Mississippi Valley, the Colorado potato beetle continues to extend its area of distribution. It has during the last and present seasons reached the Atlantic coast of the Middle States, and is preparing an invasion in mass of the maritime parts of New England, which will soon be overrun with the same ease with which it has conquered the Western and Middle States. Meanwhile the farmers are anxiously inquiring for means of destroying the invader. Materials destructive to the insects and said not to be injurious to the plant or the soil, have been recommended almost without number; but with the

exception of Paris green, they have been either very insufficiently tried or found inoperative. That compound of arsenic and copper therefore remains naturally the favorite, notwithstanding its dangerous qualities and the possible deleterious effect it may produce on the fields after long use.

Entomologists and other scientific men are often asked: "Why do you not give us another remedy against this destructive insect? Are you baffled with all your boasted progress in learning by the invasion of a wretched little bug?" No, my friends, we are not baffled by the wretched little bug, but in our endeavors to teach you how to dispose of it in such a manner as to protect your crops, we are embarrassed by your own failure to grasp the magnitude of the problem which you have set us to solve. Had you indeed comprehended the warnings given by my lamented friend B. D. Walsh, on the first injurious appearance of the insect, and since repeated by many Entomologists, you would have insisted several years ago that the subject should be investigated with a power of inquiry proportioned to its importance, and you would have received such information as might with proper and well directed industry on your part have prevented much loss.

However, I do not wish now to speak of the past; it is gone and its errors cannot be undone. Let us rather enquire what shall be done in the future.

The first thing, then, is to cease calling upon science for a remedy, when science and empiricism have probably already given you many remedies, concerning the application of which I will have a word to say by-and-by. Science can help you and will help you only when you have begun to help yourselves. How, then, can we begin to help ourselves? I hear you ask. First, then, there should be a scientific commission, selected by competent scientific authority for their merit and not for their political influence. Politicians have had too much control over our agricultural interests, as you all have reason to remember with regret. This commission should be sufficiently large to subdivide the subjects committed to them in such manner as to thoroughly investigate the habits and times of appearance in different districts of the great agricultural pests, the effect upon them of all the cheaper materials which have been or may be judiciously suggested as destroying agents, and the proper times and manner of applying them. The members of the commission should also receive sufficient compensation to warrant them in giving as much time and labor to this investigation as may be required, even to the

temporary abandonment, if necessary, of their other scientific or secular pursuits. No such task can be properly performed and completed by the solitary labors of State entomologists underpaid and overburdened with work. Only by association of several such careful observers and investigators can a worthy, useful result be obtained for the suppresion of several of the most formidable pests.

2. This information being procured, should be tabulated as far as possible, or at least reduced to a compact form for easy reference and widely published in newspapers and also in pamphlet form.

3. By the distribution of this information and by appeals through the newspapers and agricultural journals, as well as by addresses at meetings of farmers and others interested in agriculture, it must be impressed upon the public mind that all individual efforts for the suppression of these pests are frequently futile. Only combined and consentaneous action over large tracts of country will be effective.

Now, while I am prepared to believe that when these facts are made known to the farmers they will immediately see the importance of the suggestion for unanimous and simultaneous advance upon the enemy, yet without legislative aid it will be quite impossible to secure the organization requisite for an effective onslaught. It will therefore be necessary for the citizens interested to command their representatives, either in State Legislatures or in National Congress, to prepare proper laws for the destruction of these pests at stated times, to be determined and recommended by the scientific commission. These laws will be not only cheerfully obeyed by every intelligent farmer, but I know that the farmers' as a class will be glad to have such laws enacted and enforced with penalties for their neglect. Those disposed to help themselves and each other can only thus be protected against an ignorant or indolent neighbor, whose thriftlessness would otherwise make of his potato patch, his cotton field or his plum orchard a nuisance nursery from which no industry could protect the surrounding farms.

Thus, then, the organization necessary for a successful campaign against our insect enemies must be authoritatively demanded by you. Under less free forms of government the plan which I have suggested would probably have long ago been perfected by the rulers. Even the fear of the extension of the Colorado potato beetle to Europe has excited in several countries almost as much discussion and confusion of counsel as an apprehended revolution.

The fact is, that these incursions and ravages of hostile insects represent a condition of *war*. It is only by a quasi-military organization and appropriate weapons suited to the nature of the enemy that they can be conquered. Without recognition of this fact nothing can be done against them, and we must bow our heads and exclaim with the pious Mohammedan fatalist, "It is the will of God."

Three subjects yet remain to be considered—the materials to be used, the time of making the attack in force, and the weapons to be employed.

1. The materials may be either vegetable or mineral, or merely human labor intelligently and persistently applied. The latter is the only effective means of contending against some insects, but in all cases it is a necessary adjunct to the remedies used. These remedies are very numerous, and until a careful investigation is made of the large number already suggested, no proper indications can be given except that those least injurious to man should be preferred, even at greater cost of money and labor; and that those which kill the insect by contact with its body are likely to prove more effectual than those which destroy by poisoning its food. It may be here observed that the form of apparatus in these two cases must be quite different. In the latter, any contrivance which will sprinkle a fluid or dust a powder on the exposed or upper surface of the leaves will be sufficient; in the former, in which the poison kills by contact with the insect, it must be able to reach the enemy wherever sheltered.

2. The time of attack must naturally be when the enemy is least able to resist. To quote again from the excellent memoir of Motschulsky, "the most effective and at the same time the easiest mode of opposing the developement of the locusts is the crushing out of the young broods when collected in swarms in the place where they are hatched. Consequently the most important thing is to know the nesting place of these destructive pests. In order to discover them and to point out the course to be pursued * * it might be well to send skilful persons * * to make the necessary researches, and these, with the assistance of the local authorities, might seek out the places where the insects abound and establish the necessary regulations for their destruction." (l. c. p. 228.) In the case of the cotton moth it is plain that the attack should be made upon the earliest broods, which are said to appear in the extreme southern part of the country, and from which the migratory swarms which travel northward are supposed to be developed; also, that the attack must be directed against the caterpillars rather than the perfect insects.

The Colorado potato beetle may also be attacked with greatest success in the larval state. The integuments are then soft, and the appetite more voracious, so that whether the poison by contact or the poison by food be used, it will have a more certain effect than upon the perfect insect, which is protected against the former by the hard chitinous surface and against the latter by preoccupation in reproductive duties.

You will be prepared to admit the importance of the recommendation above made, that the times for making the attack should be directed by the scientific commission after full examination of the habits of the insects and the dates of their appearance in their various stages of developement. These dates will vary in different districts, and without a carefully tabulated calendar of the necessary facts, no system of combined effort, such as I believe to be essential, can be planned.

The apparatus to be used must of course vary greatly with the habits of the insects to be attacked. In the case of the plum curculio canvas frames propelled on a kind of wheelbarrow, with a ram to concuss the trunk of the tree, is probably the best instrument yet devised. The insect will fall into the net when the tree is struck, and may be easily destroyed when a sufficient mass has been collected. For the cotton moth and the potato beetle the apparatus for poisoning the leaves upon which they feed may be any simple sprinkler or dusting box, according as liquid or solid poison is employed. But for direct application to the insect itself, we must use means by which a fine spray will be driven with force sufficient to envelop the whole plant, or the surface of the ground upon which the insects are assembled, in a mist of poisonous liquid. Such an instrument is the atomizer, which has the additional advantage over the sprinkler that it consumes less liquid. The first application of the atomizer for the destruction of insects was made by me several years ago, and in the *American Naturalist* for August, 1869, I published a short paper recommending its use with certain poisonous liquids for the disinfection and preservation of insect cabinets. I have seen its frequent use with great success.

When the question of locusts became of importance last year, and the Colorado potato beetle began to be very troublesome in the Atlantic States, I spoke with several commercial friends and others about the propriety of making atomizers of large size for the destruction of these pests. In consequence of delay in the measures they thought necessary to command the attention and security of a manufacturer, no progress

has yet been made for introducing such a contrivance into general use. Meanwhile a small apparatus consisting of an atomizer, a tank of fluid supported on the back, and a pair of bellows fixed at the side of the operator, has been independently introduced by a manufacturing establishment in Philadelphia, and I have been told is somewhat of a favorite. It will doubtless be useful to a limited extent, and is not patented I believe.

For small arms, this or a somewhat larger and more complete instrument will answer, but in the war against insect pests in which I have endeavored to interest you, we must have heavy ordnance as well as weapons for hand use. Large compound atomizer tubes, with five, ten, twenty, or, in fact, an indefinite number of orifices for producing the spray, can be made, connected with large tanks of fluid and worked by a powerful current of air from a revolving fan, driven by man, horse or steam power, according to the size of the instrument. When of sufficiently large size, the machine can be mounted on wheels and transported wherever it would be required for use. Before such instruments as these an invading army of caterpillars, or even a recently hatched swarm of locusts, would be annihilated. A comparatively small number of men would be required to work a battery of this kind of field artillery, and it would be found immensely effective.

The organization recommended can be effected only by the strong appeal of the people where agricultural interests dominate, for proper instruction from the government and proper protection by legislative power. We have game laws to protect our useful wild animals; thistle laws to guard against extension of noxious weeds. Why not have insect laws for destruction of agricultural pests?

Farmers of the West, are you willing to exert yourselves to procure this result? The prize is a rich one—it is no less than immunity from an annual destruction of property quadruple or sextuple that of the great Chicago conflagration.

ON A CANADIAN SPECIES OF AGROTIS.

BY A. R. GROTE, BUFFALO, N. Y.

Mr. George Norman has sent me specimens of a species of *Agrotis* allied to *tessellata*, which were taken at Orillia. I propose to call the species *Agrotis versipellis*. The male antennae are brush-like, eyes naked,

all the tibiae spinose. The thorax and tegulae are dark brown; collar with a blackish shade in front, below which it is ashen. Head and tips of palpi grayish brown; 2nd palpal joint outwardly blackish. Fore wings blackish brown; lines geminate, distinct, with pale included shades. *Median vein narrowly striped with white.* A whitish shade over subcostal nervure. Claviform rather small, distinctly black-edged. Stigmata smaller than in *tessellata*, grayish brown, the cell between them, and before the ovate orbicular, blackish. Median space of a clearer brown below the median vein. Course of the median lines much like *tessellata;* the t. p. a little more exserted opposite the median nervules. Subterminal line a nearly straight gray shade, thus differing decidedly from *tessellata.* Hind wings blackish fuscous, a little paler at base, with paler fringes and reflection of the discal lunule from beneath, where both wings are blackish fuscous and show a faint common line. *Expanse* 30 m. m.

This is a handsome species and seems to be easily distinguished from its ally by the white median vein. It seems intermediate between *tessellata* and *Ridingsiana.*

I have been shown in Detroit, by Mr. J. A. Lintner and Mr. O. S. Westcott, specimens of an *Agrotis* new to me, but which I thought might prove the true *obeliscoides* of Gueneé, from my memory of his description. This is in so far interesting, as I have been disposed, in the absence of another species, to consider *scxatilis* as the species intended by Gueneé.

ON CERTAIN SPECIES OF MOTHS FROM FLORIDA.

BY A. R. GROTE, BUFFALO, N. Y.

The following species were collected by Mr. Schwarz and Mr. Bela Hubbard, of the Detroit Scientific Association, among other most valuable scientific material, obtained during a recent visit to Florida.

Megathymus yuccae (Bdv. & Lec.) Scudd.

The eyes are large and naked; caputal squamation of mixed flattened scales and hair. I cannot find any ocelli. The cylindrical, scaled antennæ are capitate, without terminal inflection or hooklet. The tibiæ and tarsi are strongly spinose; hind and middle tibiæ with terminal claw. I regard the insect as belonging to the Castnians, where it is placed by Walker. The ornamentation mimics the Hesperians.

Haulover, Fla., March 8.

Aegeria floridensis, n. s.

♂. Seems to belong to a new structural group, for which I propose the name *Pyrrhotaenia.* The antennæ are heavy, lengthily pilose, brush-like. The naked eyes are banded black and golden, narrowed superiorly. The ocelli are large. The head is narrow, prominent; palpi curved, long, ascending, free from the front; maxillæ moderate. Anterior wings scaled, very narrow, widening terminally at outer third, blackish violaceous. The narrow portion of the wing is medially orange red, interrupted by the ground color at beyond the disc. Beyond the interruption the interspaces are orange red for a short space; the internal margin to terminal third is narrowly streaked with orange red. Beneath largely shaded with orange; the violaceous terminal portion of the wing interspaceally rayed with orange. Hind wings pellucid, with narrow orange costal border and blackish fringes. Head covered with broad blackish violaceous scales antennæ violaceous. Palpi and collar orange. Legs violaceous, marked with orange; hind tibiæ twice broadly banded with orange. Abdomen blackish cyaneous, with a concolorous terminal tuft containing a few white scales; two terminal segments banded with orange, fourth from the tip orange banded, this color extending beneath.

Expanse of fore wing, 6 m. m. *Total length of body*, 9 m. m.

Enterprise, Fla., May 29.

Cosmosoma omphale Hübn.

Haulover, Fla., March 9.

Syntomeida ipomaeae Harris.

The discal dot is sometimes obsolete on the fore wings above.

Enterprise, Fla., May 28.

Didasys, n. g.

A form allied to the Cuban *Burtia.* The abdomen in the male provided with two lateral, elongate, pilose, blackish terminal tufts, one on each side, arising from the genital pieces, which latter are prominent, exceeding the anus, when closed forming a whitish U beneath, from the color of the scales. The large ocelli are removed from the somewhat narrowed, naked eyes. The plumose ♂ antennæ are thickly furnished with lengthy setose pectinations. Palpi moderate, pointed, exceeding the front. Shape of the wings as is usual in the group. The median fold of *Cosmosoma* is absent.

Didasys Belae, n. s.

Vertex, collar, base of the primaries and palpi orange; terminal palpal joints blackish. Antennae black; legs blackish, streaked with whitish and with whitish fore coxæ. Abdomen above orange scarlet, terminal segments with short lateral fluffy tuftlets, the terminal ones touched with black. Thorax and patagia black, neatly lined with pale. Abdomen beneath orange at base, the terminal portion whitish with blackish incisures. Fore wings pellucid; veins black marked. A wide black terminal band enclosing a series of six interspaceal orange yellow spots, arranged subterminally in a series following the shape of the terminal margin. An orange yellow discal spot narrowly edged with black. Internal margin blackish, narrowly streaked with yellow. Hind wings pellucid, with black borders and the costal edge narrowly yellowish. Beneath as above, the spots of a paler orange. The ♀ has a dorsal row of abdominal black dots; anal segments terminally brownish; the dorsal abdominal markings are very slightly shown by the ♂ on close inspection.

♂, Cedar Keys, June 4, expands 26 m. m.; the two terminal tufts are 3 m. m. in length.

Dahana, n. g.*

A form between the clear-winged Glaucopid genera and *Ctenucha*. The narrow primaries are one-third longer than the entire body. Both pair of wings are closely scaled, cyaneous black terminally, but mostly dead black. Antennae long, plumosely pectinate in the male, serrate in the female. Abdomen rounded terminally, without anal tufts in the male, short in both sexes and plump. Ocelli near the margin of the narrowed naked eyes. Palpi exceeding the front.

Dahana atripennis, n. s.

Face mixed cyaneous and yellow; orbits of the eyes, palpi at base, sides of the thorax in front dark yellow; terminally the palpi are black. Thorax beneath cyaneous, brilliant; above black with yellow edges to the patagia at base and streaked with cyaneous. Abdomen brilliant blue laterally at base, else orange above in the male, yellow in the female. Fore wings dull black, slightly blue outwardly in male, with a yellow fleck above internal angle. Hind wings cyaneous black above, with short pale fringes. Beneath fore wings more blue at base, with the yellow streaky

* Sanskrit: the Dawn.

shade at internal margin more diffuse. Hind wings immaculate beneath. Abdomen dusky along the venter.

Length of primary 18, of the body 12 m. m.

Enterprise, Fla., May 28.

The male is the more gaily colored, and has the blue reflections more noticeable.

Hexeris enhydris, n. g. et sp.

♀. There are no ocelli, and thus there is a resemblance to the Geometridae in a form resembling the Fasciatae in the long labial palpi. The cut of the wings rather resembles *Endropia.* The labial palpi are extended straightly forwards for more than twice the length of the head. The palpi are divaricate, the third joint linear, elongate, more than half the length of the second. Antennae simple, comparatively short; the genus seems distantly related to *Syllectra.* Fore wings 12 veined, no accessory cell; veins 7, 8, 9, thrown off near together from the upper extremity of the cell; cell incompletely closed; 5 nearer to 4 than to 6; 8 to apex. The position of 5 seems to me decisive, and that we have to do with a Noctuid. Hind wings 8 veined, 3 and 4 from one joint, 5 near 4; cell closed by a fold or obsolete vein; 5 hardly weaker than the rest. The divided frenulum indicates the sex of the specimen. The frenulum seems to be homologous with the marginal or sixth principal vein of butterflies. Mr. Scudder has pointed out to me that this number is sometimes present in the higher groups. The frenulum cannot be considered a specialized hair. I have before come to the conclusion that it represents a missing vein; the reason for its complexity in the female I cannot yet suggest. In the new form the legs are slender, long and unarmed. The entire insect is pale ochreous, shaded with rusty, and in color and ornamentation resembles some of the Geometridae. The fore wings have common wavy rusty lines, and are mottled or subreticulate in appearance. A median line bent at the middle of the wing, where it unites with an outer line from the costa, and thus sketching the figure of a crooked Y, is noticeable. Beneath the same markings come out, the broader rusty lines of the upper surface being reproduced on a yellowish ground. Length of fore wing 17 m. m.

Two specimens collected at Fort Capron, Fla.; the largest is before me. I am much indebted to Mr. Geo. Dimmock for his preparation of the wings of the specimen by a valuable process discovered by him, an account of which was read before the American Association for the Advancement of Science.

MEETINGS OF THE ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

According to previous announcement, the first meeting of this club was held in the rooms of the Detroit Scientific Association, on the 10th of August, at 2 : 30 p. m., Dr. J. L. Leconte, President in the chair, Prof. C. V. Riley, Secretary. The attendance was large, including S. H. Scudder, Esq., Cambridge, Mass., Vice-President, and Messrs. A. R. Grote, Buffalo. N. Y., W. Saunders, London, Ont., B. P. Mann and E. P. Austin, of Cambridge, Mass., Prof. E. S. Morse, Salem, Mass., J. A. Lintner, Albany, N. Y., E. A. Schwarz, H. G. Hubbard and B. Walker, of Detroit, Dr. A. E. Dalrymple and Dr. J. G. Morris, Baltimore, Md., Prof. A. J. Cook, Lansing, Mich., Dr. Hoy, Racine, Wisconsin, Clinton Roosevelt and Geo. Dimmock, Springfield, Mass., B. D. Sanders, J. C. Holmes and Wm. Provis, Detroit, J. T. Ison, Cleveland, Ohio, and others.

President Leconte, in a few opening remarks, stated the objects had n view in the formation of this club. They were chiefly to cultivate closer personal relations among those interested in Entomological pursuits, many of whom were widely separated by distance, to exchange views and record observations, and to exhibit specimens of interest. He hoped that the meetings would not only be fruitful in these respects, but that, seeing the importance of Entomology in its relation to agriculture, some good to the country might flow from the deliberations.

Mr. Wm. Saunders mentioned the fact of the unusual scarcity of insects of the Saw-fly family (Tenthredinidæ) throughout western Ontario, especially those destructive to fruit, naming the Gooseberry Saw-fly *(Nematus ventricosus)* and the Pear Tree Slug *(Selandria cerasi)*. Both these insects, although enormously abundant and destructive in 1874, had been quite scarce in 1875. He called for suggestions as to the cause, his own impression being that this diminution had been caused by the severity of the late winter and spring.

Prof. Cook, of Lansing, Mich., had not observed any remarkable scarcity of these species in his neigborhood.

Prof. Riley had remarked their almost entire absence in some localities, and their comparative abundance in others.

Mr. A. R. Grote exhibited specimens of *Agrotis islandica* from the top of the White Mountains and from Labrador.

A lengthy discussion on nomenclature ensued, and was participated in by many of the members present, it being generally conceded that some action should be taken by the club, looking to the adoption of some rules or suggestions which might guide the Entomologists of the country on this perplexing question. On motion, Messrs. Scudder, Riley and Saunders were appointed a committee to take the matter of nomenclature into consideration and present it at a future meeting in such form as to offer opportunity for more definite discussion.

Mr. Scudder spoke favorably of *Psyche*, the organ of the Cambridge Entomological Club, and urged that members subscribe for it on account of its excellent bibliographical record.

Mr. Mann called attention to the difficulty of getting hold of State Reports, and thought there should be some system adopted by which these reports could be placed on sale, so that Entomologists who desired to do so might purchase them.

Mr. Saunders thought that if some plan could be devised whereby the valuable facts and suggestions contained in these various reports could be brought together, condensed into one volume, and made available to agriculturists as well as entomologists, that much good would result from it.

The President suggested that such a work might well be done by the general government, and would be much more valuable than the volume it now sends out.

On motion, it was resolved that this club request the American Association for the Advancement of Science to take such action as seems best calculated to secure the placing of State Reports upon scientific subjects in the library of the Association. The Secretary was instructed to bring this subject before the Association.

Dr. Morris referred to the scarcity of Sphingidae about Baltimore during the present season, an experience which was corroborated by other members present. Mr. Austin had found all insects unusually scarce about the White Mountains, where he had been collecting for the past two years. Mr. Riley thought the very severe and late winter and the unusually rainy summer in part explained the fact.

Mr. Scudder offered some remarks on the great abundance of the Army Worm (*Leucania unipuncta*) in portions of Massachusetts, as an

exception to the general rule of scarcity of insect life; he had made a calculation from the number counted in a square foot, that in a field near Cambridge there must have been as many as two million worms to the acre. Other members offered similar experience in reference to this species. Mr. Riley stated that the Army Worm generally abounds during a very wet summer following a very dry year.

Mr. Lintner referred to the great scarcity of *Orgyia leucostigma* as in striking contrast to its abundance last year in Albany.

The election of officers then took place, resulting in the re-election of Dr. John L. Leconte as President, Samuel H. Scudder, Vice-President, and C. V. Riley, Secretary.

Mr. Riley read a paper on "Locusts as Food," in which he gave his own experience in cooking and eating them. On one occasion he ate nothing else for a whole day. He found them to have an agreeable nutty flavor, and especially recommended them deprived of their legs and wing cases, and fried in butter, and also spoke very highly of a soup made from them. He referred to John the Baptist, who had often been pitied for the scantiness of his fare, locusts and wild honey; Mr. Riley thought he had been well provided for. The writer regarded it as absurd that parties should actually die of starvation, as some had done in the districts where this locust plague had prevailed, while surrounded by such an abundance of nutritious and palatable food.

The meeting then adjourned, subject to the call of the President.

On Tuesday evening, the Cambridge Entomological Club held a meeting, when all interested in Entomology were invited to be present. W. Saunders, of London, Ont., was called to the chair. After the usual routine business had been disposed of, Mr. George Dimmock read a paper on the recent excursion of the Cambridge Club to the White Mountains, where the members had spent some two weeks in collecting. The experiences related were of a very interesting character, showing that the party, besides accomplishing much useful work, had thoroughly enjoyed their trip. Mr. Austin, who had been one of the party, exhibited a large collection of insects made during the past two years among the White Mountains, embracing many very interesting species, and offered some remarks on their habits.

Messrs. Cook, Lintner, Morris and Riley were elected members of the Club.

Mr. Grote presented some instructive facts in relation to the identity of some of the White Mountain moths with those of Labrador. Mr. Riley enquired whether many *Caloptenus* had been found on Mount Washington, and expressed the opinion that a race of *spretus* had been found there.

Mr. Saunders enquired of the Michigan friends whether *Pieris rapæ* had been found in the State. Prof. Cook stated that it had not yet appeared in Michigan; he remarked that *protodice* was much more numerous than *oleracea*. Mr. Riley stated that *protodice* was most abundant throughout Illinois and Missouri. Mr. Ison, of Cleveland, stated that *rapæ* appeared in his neighborhood for the first time last spring; at first it was found along the lake shore, but before the season closed it was abundant throughout the greater part of the district over which his observation had extended. Mr. Ison said that with them the larva seemed to prefer mignonette to cabbage. In reply to a question as to the correctness of the views advanced by some Entomologists in regard to the color of the imago being affected by this food plant, Mr. Lintner said that he had, from among 500 or 600 specimens fed on cabbage, found a number of the yellow variety. Mr. Riley stated that the larva of *protodice* was also partial to mignonette.

Danais archippus formed the next topic of discussion. Mr. Cook had found the larva this season peculiarly infested by several parasites. Mr. Riley had seen Tachina flies bred from *archippus*. Mr. Saunders had reared, on one occasion, a large number of small Hymenopterous parasites from a chrysalis. He also asked the members if any explanation could be given of the reason why this species assembled occasionally in immense swarms and migrated thus from place to place, and referred to instances of such swarming. Mr. Ison referred to an immense swarm which passed over Cleveland three years ago. In this instance it appeared as if they had crossed the lake from Canada; they were seen in immense numbers for three or four days. *Archippus* was said to occur in Australia, where it also occasionally swarms.

(To be concluded in our next.)

The Canadian Entomologist.

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MEETINGS OF THE ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

(Concluded from September No.)

References were made by Mr. Grote to several rare captures of Lepidoptera in the vicinity of Buffalo. Among others he had taken *Thecla ocellifera*, which is also found in the West Indies. Mr. Saunders stated that he had again reared a specimen of *Thecla strigosa* from thorn, and referred to the capture of specimens of *P. thoas* and *P. marcellus* at North Ridge, Ont., by Mr. F. C. Lowe, of Dunnville. Mr. Cook said that *thoas* had been found this year at Lansing, that it occurred there to his knowledge some three years ago, and that last season it was quite common, the larva feeding on prickly ash. Mr. Riley stated that the larvae of *philenor* feed on a creeping plant very closely allied to Aristolochia. Mr. Ison has found *philenor* scarce about Cleveland during the last five or six years, but *marcellus* rather common ; the larva of the latter feeds on pawpaw. One of the Detroit members remarked that there were pawpaw bushes growing within a few miles of Detroit.

A discussion on sugaring for Noctuæ was next in order. Mr. Ison reported excellent success with this method at Cleveland ; he preferred adding a little rum to the usual mixture of beer and molasses or coarse sugar. Mr. Lintner greatly interested the members in relating his wonderful success in sugaring. He produced a tabulated list of Noctuidæ captured or observed at sugar at Schenectady, N. Y., commencing with July 7th, giving the results of sixteen evenings in that month, and four evenings in August.

Seventy-eight species of Noctuæ are recorded, and opposite each species observed or collected is placed a check in a column bearing the day of the month at its head. Four species were observed on each evening, viz., *Hadena arctica*, *Hydroecia sera*, *Homopyralis tactus* and

Asopia costalis. Of the first two, hundreds could have been collected on a single evening. *Hadena lignicolor* was unobserved on only one evening; *Erastria carneola* on only two evenings; *Catocala ultronia* and *Hadena devastator* on only three evenings.

The following species were common: *A. herbida*, *A. haruspica*, *A. plecta*, *Orthodes infirma*, *Pseudothyatira expultrix*, *Hydroecia nictitans*, *Amphipyra pyramidoides* and *Erastria nigritula*. Of *Catocala ultronia* about *seventy* examples in fine condition were captured; of *Catocala nuptala*, of which not a single example had ever before been taken by Mr. L., thirty-six were collected, and of *Catocala parta* sixteen examples had been secured, all in perfect condition. Specimens of *Catocala Meskei*, *C. serena*, *C. Briseis*, *C. Clintonii*, *C. polygona* and *C. similis* had also been obtained.

Mr. L. has become quite enthusiastic over the success with which he has met thus far, in the number of rare species collected, and particularly in the perfect condition in which the larger portion of them are obtained. It is his purpose to continue his collecting in this method, and also the tabulation of the results. The table, when completed at the end of the season, will probably be published in the New York State Museum Report. We are sure that it will prove a valuable contribution to that part of the natural history of our moths which relates to the number and duration of their several broods.

Mr. Mann exhibited specimens of the wood of *Agave Americanum*, which, when cut of the proper thickness, may be used as a substitute for cork. This wood is remarkably light and porous, and pins may with great ease be firmly pushed into its substance. It grows in Brazil, and can be obtained from Mr. Mann at a lower price than cork. In proof of the suitability of this material for the purpose named, Mr. Mann stated that Wallace preserved all his specimens collected in the East Indies in boxes made with pieces of this wood pinned together with thorns.

At a late hour this most enjoyable meeting was brought to a close.

On Thursday afternoon a large proportion of the members of the club joined in an excursion to some good collecting grounds in the neighborhood of Fort Wayne, the party being under the direction of Mr. Hubbard, of Detroit. A very pleasant and profitable time was thus spent, and many interesting specimens captured. In addition to the advantage enjoyed of closer social intercourse between the "brethren of the net," this occasion afforded an opportunity for the mutual exchange

of practical ideas in regard to collecting insects which no in-door meeting could have afforded. It seemed as if every member had *some* original idea of his own either in reference to capturing or carrying specimens, the advantages of which were freely urged and as freely discussed with much profit. After thoroughly enjoying themselves for several hours, the members returned at nightfall well satisfied with the afternoon's sport.

On Friday morning a second meeting of the Entomological Club was held at the rooms of the Detroit Scientific Association. In the absence of the President, Mr. Lintner was called to the chair.

The Committee on Nomenclature reported as follows :—

" The committee appointed at the last meeting of the Entomological Club to consider whether any immediate action is advisable on the part of the club to aid in establishing uniformity in zoological nomenclature, finding that the committee of the general association intends to report during the present session, and deeming it best to await this report before making any definite proposition, would at the present time recommend that the club appoint a committee of five to prepare and present to the club at its next annual meeting a compendium of the views of the leading entomologists of the country upon points which, in their judgment, require elucidation, and also to present a series of resolutions touching such points, in order that intelligent discussion may be had upon them, and some general agreement, if possible, arrived at.

Signed, Samuel H. Scudder,
C. V. Riley,
Wm. Saunders."

On motion the report was adopted, and the appointment of the committee left with the President, who subsequently nominated the following gentlemen :—Messrs. Scudder, Saunders, Grote, Riley and Leconte.

An interesting discussion then took place in reference to the various methods of pronunciation followed by entomologists when speaking of insect names, which culminated in the following resolution, which was carried unanimously.

Resolved, that in view of the desirability of securing uniformity among Entomologists in the pronunciation of the names of insects, Mr. O. S. Westcott, of Chicago, be requested to prepare such an accentuated list for publication in the Canadian Entomologist.

Mr. Westcott very kindly promised to give his attention to this matter at an early date. We shall hail the advent of this list with much satisfaction; it is a work greatly needed, and coming from the hands of one who is in every way well fitted to do it justice, we feel sure that it will command general assent.

The next subject of discussion was on certain offensive names which have been proposed for insects, in which most of the members took part. The following resolution was unanimously adopted :—

Resolved, that in view of the fact that certain names have of late been proposed for insects which are offensive and unwarrantable, that the Committee on Nomenclature be requested to present at the meeting next year a list of such names as should be ignored, so that the club may take action in reference to them.

Some explanations were then offered in regard to a valuable discovery lately made by Mr. George Dimmock, of Springfield Mass., of a ready method of removing the scales from the wings of Lepidopterous insects, so as to display the vein structure. Mr. Dimmock had kindly shown the admirable working of his process to a number of Entomologists at his room the evening previous, when all present were struck with the great practical value of the discovery. After full explanations to those present who had not seen the working of the process, it was resolved, "That the thanks of the members of the Entomological Club be given to Mr. Dimmock for his valuable discovery in reference to a ready method of denuding the wings of insects."

This process of Mr. Dimmock's formed the subject of a paper read before the American Association, and which will be published, we believe, in an early number of *Psyche*. It may thus be briefly explained: All the materials necessary are a little alcohol, a saturated aqueous solution of chloride of lime, a phial of pure muriatic acid and another of sulphuric acid. The wings are first moistened with alcohol, then transferred to the solution of chloride of lime, to which a little of the sulphuric acid has been added. After immersion for a few moments, the coloring matter of the scales rapidly disappears. This result may be hastened by taking the wings out of the chloride of lime solution and immersing for a moment n the muriatic acid, diluted with twice its weight of water, and then returning them again to the former solution. This alternation may be repeated as often as required. By this means any quantity of wings of Lepidoptera may be safely and entirely denuded with little or no trouble.

The denuded wings were neatly mounted by Mr. Dimmock on white cards, to which they had been gummed. An interesting collection, illustrating the nerve structure of many of the genera of moths, was exhibited by him, to the great gratification of all present.

In the compilation of these memoranda in regard to the meetings of the Entomological Club, we are greatly indebted to the Secretary, Prof. C. V. Riley, who very kindly placed his notes at our disposal; also to Mr. B. P. Mann, of Cambridge, who did us similar service.

ON CATOCALA VERRILLIANA, WITH NOTES ON CATOCALA RELICTA.

BY A. R. GROTE, BUFFALO, N. Y.

Catocala Verrilliana Grote, Bul. B. S. N. S., 3, 12 (Aug., 1875).

The smallest N. Am. red-winged species known. It has a resemblance to *polygama* and *fratercula* in the ornamentation of the primaries. Fore wings gray, shaded with blackish; lines black. A diffuse basal black shade. T. a. line diffusely shaded with black. Reniform small, yellowish, more or less distinctly double ringed. Sub-reniform small, yellowish, disconnected with the t. p. line. T. p. line shaped much as in *polygama*. Hind wings bright red. Median black band narrow, tolerably even throughout, not attaining internal margin. Terminal band black, narrow, not quite attaining anal angle. A red apical mark, opposite which the fringes are pale. Medially the black band is five times outwardly scalloped, and opposite this scalloping the fringes are blackish. The red color again prevails below them on the margin, with the pale fringes; towards anal angle the fringes are dusky. Beneath, both wings red, with constricted median band on hind wings not attaining the margin.

Expanse 48 m. m. G. W. Belfrage, Bosque Co., Texas, June 13. Dedicated to Prof. A. E. Verrill, of New Haven. Interesting as a form of the red-winged group, resembling the yellow-winged and smaller species of the genus.

I am indebted to Prof. Hopffer, of the Royal Museum of Berlin, for a beautiful water colored drawing of the Texan *Catocala frederici* Grote,

the types of which species, from Texas, are contained in the Royal Museum.

Catocala relicta (Walk.)

I have recently examined my material of this species taken in Buffalo and Batavia, N. Y., and I find that the dark shading of the fore wings is not a sexual, but a varietal character. I have a male (as shown by the simple frenulum and the genitalia) which is darker than the specimen figured by Mr. Strecker as a female. I have also a female whiter than Mr. Strecker's figure of the male as regards the fore wings. It is evident from the form of the abdomen that both Mr. Strecker's figures are males. The sexual character is adopted from earlier writers, who had slender material, without personal verification by Mr. Strecker.

ON NEW SPECIES OF AGROTIS.

BY A. R. GROTE, BUFFALO, N. Y.

Agrotis Treati, n. s.

♂. Allied to *A. bicarnea* Guen.; smaller and distinguishable by the evenness of the t. p. line. Fore wings dead brownish black. T. a. line rigidly oblique to submedian fold, not rounded as in its ally, and with a less prominent tooth on internal margin. A very faint yellowish shading to the line and also on the costa at inception of t. p. line, where *A. bicarnea* is strongly marked with carneous. T. p. line shaped as in its ally, but even, geminate, the inner line not scalloped; the component lines include a pale shading. Disc velvety black between the narrow stigmata, which are concolorous with the dead black of the wing. A black shade at base below the median vein. All the transverse lines geminate; the inner line of the basal and t. p., and the outer line of the t. a., marked with velvety black. In one specimen there is an absence of the velvety black shades; this one is in imperfect condition and allows of no certain description. Hind wings yellowish gray, paler than in *bicarnea*, with a noticeable terminal darker shading. Beneath with common line and

strong lunule on secondaries. Head dark brown on vertex, with pale marginal lines; terminal palpal joints pale; collar brown, with a black and pale line at base. Legs dark, pale dotted. Thorax brownish black, with pale line at base of tegulæ. Abdomen like secondaries.

Expanse 34 m. m. Mass., Mr. Thaxter, No. 2,311. Named for Mr. James O. Treat, of Andover, Mass.

Agrotis brunneipennis, n. s.

♂. Allied to *cupida*, but smaller. Fore tibiae unarmed. Thorax and fore wings of a glossy chestnut brown, somewhat reddish. None of the usual markings are noticeable. The subterminal space is stained with blackish. Following the s. t. line is a series of faint pale interspaceal fleckings. Ordinary lines indicated on costal region. Hind wings blackish fuscous. Abdomen beneath stained with reddish brown as is the costal region of primaries; else the blackish wings beneath show only a common black transverse line, which fades out towards the internal margins. Palpi black at the sides. Head brown above.

Expanse 30 m. m. Mass., Mr. Thaxter, No. 2,303.

Agrotis friabilis, n. s.

♀. A small species with a resemblance to *Bostoniensis*. All the tibiæ spinose, the fore pair with larger terminal spinules; clypeus roughened. Fore wings fuscous gray, with indistinct darker markings. The t. p. line is lunulate; the t. a. line widely geminate and dentate; stigmata obsolete; median shade noticeable; terminal space more purely gray than the rest of the wing. Hind wings concolorous, pale grayish fuscous, above without line or spot; beneath (where they are whitish with the costal region powdered with fuscous) there is a faint median shading. Fore wings beneath with a faint median line distinctly marked in black on costa.

Expanse 30 m. m. Taken by Mr. Geo. Norman; number 371.

Agrotis badicollis (Grote).

Mr. Norman sends me a fine male with the transverse lines broadly marked in black, and Mr. Lintner has again sent me my ♀ type. I have mistaken the black scales about the eyes for true lashes. Mr. Morrison's correction, as to the genus, must, then, be accepted. The species seems to vary greatly in distinctness of markings.

Agrotis campestris Grote.

This species, collected by Mr. Geo. Norman at Orillia, No. 372, appears to be a form of *tessellata* (*maizi* Fitch); it differs by the red brown tinge of thorax and fringes, the unicolorous purplish black brown primaries, and the coarseness of the black median lines. Specimens are before me from N. Y. (Mead) and Vancouver Island (Hy. Edwards, 5,644). With other species of the genus, it is described in a paper presented to the Academy of Natural Sciences, Philadelphia.

ON A NEW CANADIAN LITHOPHANE AND SCOPELOSOMA.

BY A. R. GROTE, BUFFALO, N. Y.

Mr. George Norman has recently taken a number of the species of the genus *Lithophane* at Orillia. In a recent letter, Mr. Norman records the capture of *petulca*, *ferrealis*, *disposita*, *Bethunei*, *semiusta*, and "that lovely *oriunda*, a single specimen." Mr. Norman also finds a number of specimens of a large light grey species allied to *laticinerea*, but differing from that species and *cinerea* in the position of the stigmata, the color, and the shape of the subterminal line. I propose to call the species *Lithophane Georgii*, after its discoverer. Fore wings bluish grey, with a white shade on the shoulder above the black basal dash. T. a. line dentate, indistinct. Orbicular erect, not oblique, moderate, concolorous, with a paler annulus. In shape, color and form this spot offers decided differences when compared with allied species. Reniform squarish, darker stained than the wing, proportionally smaller than in allied forms. T. p. line sub-obsolete; it appears to run nearer the subterminal line than usual; the latter line consists of a series of disconnected, distinct, interspaceal, blackish, triangulate marks. Fringes entire, concolorous. Hind wings blackish fuscous, beneath with spot and line. Thorax concolorous with primaries; collar with a black line in front; face with a black line; antennæ whitish at base. *Expanse* 48 m. m.

I have received from Mr. J. Pettit, of Grimsby, Ont., two specimens of a small species of *Scopelosoma*, which I propose to call *Pettiti*. The little roughly scaled species presents some resemblance in ornamentation to *Scopelosoma Graefiana*. The color is orange ferruginous over light yellow;

head, antennæ, thorax and fore wings of this color. Primaries with three transverse darker lines, the t. a., median shade and t. p. lines, all indistinct, the t. p. line followed by faint blackish points. Orbicular small, round, pale centered. Reniform large, vague, sometimes with a few blackish scales inferiorly. T. a. line perpendicular, undulate ; t. p. line even. Abdomen and hind wings above, very pale silky yellowish ; beneath a little darker, the latter with orange spot and median and terminal lines ; fringes concolorous. Fore wings with line and dot faintly shown. *Expanse* 30 to 31 m. m.

ARGYNNIS MYRINA AND ITS ALLEGED ABNORMAL PECULIARITIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

In the Am. Nat., Sept., 1872, Mr. Scudder published an essay entitled "The Curious History of a Butterfly," in which it is stated that in two N. American species of the "genus Brenthis," namely, *myrina* and *bellona*, occurs a phenomenon considered by the author to be quite unique among butterflies : there being two sets of individuals, each following its own cycle of changes, apparently with as little to do with the other set as if it were a different species ; each set having its own distinct seasons and thus giving rise to the apparition of two or three successive broods in the course of the year. At the very end of the season one of these sets, which the author calls the "aestival," lays eggs which hatch in a few days ; the larvæ at once commence hybernation, to awake and begin to feed early the next season, attaining their growth by the end of June, and emerging as butterflies about the middle of July. These butterflies continue on the wing till the end of September.

The second set, called the "vernal," hybernate as half grown caterpillars, and the butterflies from them appear about the middle of May, sometimes earlier, but are hardly common before the end of May, and also live till September. These lay their eggs the last of July and early in August, the eggs hatch, the larvæ moult twice, and beyond that, behave differently, some at once entering on their hybernation, giving butterflies

in May again ; the others proceeding to chrysalis, from which the butterflies emerge in September, "*doomed to an untimely end. Their sisters of the aestival series are busily laying eggs to perpetuate the race, but to them is this boon denied; the cold autumnal blasts sweep them away before the eggs are half developed in their ovaries.* It is, in fact, a vain effort of Nature to develop a second brood." Elsewhere this is spoken of as a "waste of energy on the part of Nature."

It is expressly stated that "*in this butterfly the eggs are wholly undeveloped at the birth of the female.*" The above statement of facts leads the author to conclude that "we have here two independent series in the same species, each single-brooded, but one making an effort towards a second generation, *invariably ending in disaster;* that it is improbable that the blood of both series ever commingles through the union of the butterflies of the two series, because, although the generations overlap, *the males of a brood are the first to disappear*, and the *females the last to appear*, and at best there would be few that could thus mate ; moreover, *since the eggs of the freshly emerged females are not fully developed for weeks or even months*, the effect of such a union would be questionable. Yet if there is no union between the two series, then are the vernal and aestival groups practically as distinct from each other as any two species. The two groups *show a difference such as usually characterizes somewhat distant genera.*"

Mr. Scudder's observations on these species were so different from those on an allied European species, *euphrosyne*, as related by Doubleday, that he could not comprehend the statement given, and says : "By this account the butterflies *(euphrosyne) lay their eggs on their first appearance; either they differ in toto from their congeners in America, or there is some error in this statement* (of Doubleday).

When I first read Mr. Scudder's paper it occurred to me that possibly there was error in his statement of facts. But as these butterflies are not inhabitants of my district, I have had no opportunity to put Nature to the question till the last season, and the result is as I anticipated. She may dry her tears, unveil her blushing cheeks, and walk forth acquitted of the horrid charge. I think it will appear that the history of the butterfly, although curious, as I find the history of every species of butterfly which I have studied, is not unlike that of many of the double-brooded species, and certainly runs parallel with some of them.

In July, 1875, I was at Hunter, in the Catskill Mountains, and both

myrina and *bellona* were rather abundant. The females of both species were more or less worn and were heavy with eggs. I shut up half a dozen of each species in a muslin bag, which was drawn over the top of a flower pot in which I had set plants of wild violet. Between the 20th and 25th inst. both species laid many eggs, and these hatched in about five days. I lost nearly all the *bellona* eggs by mailing them to Coalburgh, but three which I sent Miss Peart for drawings gave larvæ, and in due time the larvae became chrysalids and yielded butterflies on or before the 1st of September.

But as I kept the larvae of *myrina*, my observations relate to them only. These grew very rapidly, moulted five times, and the first of them reached chrysalis on the 27th of August, about thirty days from the egg. The butterfly emerged on the 3rd of September, and was a female. Next day five emerged, three ♀ and two ♂ (I mention the sex to show that the females emerge as early as the males, and this is so in all species of butterflies which I have made observations on, except one, *Apatura clyton*, and in this the male has been found to appear about a week in advance of the female). The other butterflies emerged at intervals till September 9th, by which time twenty-five had appeared. Not one of this brood of larvae hybernated after the third moult, or at all, and all the chrysalids gave butterflies. On opening the abdomens of the newly emerged females, *they were found full of nearly mature eggs*. These eggs were soft, but nearly or quite full sized, and distinctly ribbed, which would not be so if they were not almost ripe for deposition. I have never found this to be the case in the larger species of *Argynnis*, there being so far as I have examined, and I have done this in very many instances, no appearance of the egg for weeks after the females are on the wing. But in some other butterflies, as *Papilio ajax*, the eggs are almost ready to deposit when the female issues from the chrysalis, and it is certain that she deposits them within a few days—say a week—from chrysalis.

So far I have given my own observations upon *myrina*. Adding to them such as are related by Mr. Scudder, and not involving the error as to a long period of time being required to mature the eggs, and the history of the species resolves itself into this shape.

The butterfly of the fall brood emerges from chrysalis about the 1st of September, lays eggs on or before the 15th, the larvae hatch between the 20th and the 24th, and go at once into hybernation, to awake in May, and reach chrysalis about the middle of June, and the butterfly about the 25th

of June. If, however, any of the last brood of larvae, instead of at once beginning hybernation, incline to feed for two or three weeks, there is plenty of time before severe frosts come to do so and reach the third moult, at which time, in all five-moulting species that I have experimented on, the hybernation occurs, if at all. In such case the larvae would also awake in May, and would reach the butterfly stage two or three weeks earlier than the 25th of June. If any of the summer brood of larvae hybernate after their third moult (a fact which I had no opportunity to establish), then the larvae of both broods would awake at the same time and become butterflies at the same time, making the summer brood. It is to be observed that the several stages of the same brood of larvae do not occur in exactly the same periods of time. From eggs laid on the same day, by the same female, some of the larvae hatched will reach chrysalis several days before others. In the larger *Argynnis* there will be such a difference, amounting to two or three weeks. Therefore some of the larvae which hybernate at the third moult may be retarded so that their butterflies shall emerge contemporaneously with those which proceed from the larvae that hybernate as soon as they leave the egg. The case is parallel with that of *Phyciodes nycteis* and with that of *Apatura celtis*, both double-brooded species, both discovering larvae from the summer brood which hybernate when half grown, while a part of the brood go on to chrysalis and give the fall brood of butterflies, these again producing larvae which also hybernate. (In both these the last hybernation begins after the larva is half grown, the third moult in *nycteis*, the second in *celtis*.) Mr. Scudder has made a hypothetical case which is precisely the actual case that I have set forth above. He says: "Should the season be so long that the *second brood could lay eggs*, the caterpillars would then be forced to hybernate as those of the aestival series and *become members of that series the next year. Thus the vernal series would continually feed the aestival*," &c. Moreover, in no species do the several preparatory stages of its members run even. On the contrary, in any, whether single or double brooded, there will be found by different females eggs freshly laid, eggs ready to hatch, young larvæ and mature larvæ, all at the same time. By this means there is kept up for a long period, often for weeks, a succession of newly emerged butterflies of the same brood, and the newer and older are constantly mating. On one day in September of this year I cut a branch of Wild Senna *(cassia)*, on which at the moment were newly laid eggs of *Terias nicippe*, larvæ in every stage of growth, and a butterfly of the same species just emerged and still resting on the empty shell of its chrysalis.

I have bred from the egg four of our larger species of *Argynnis*, viz., *diana*, *cybele*, *aphrodite* and *idalia*, and have had the egg and chrysalis of *atlantis*, and have drawings of the several stages of each species; and now having bred *myrina*, I can say that so far as I have seen of the preparatory stages of all these species, they are congeneric The simple difference that is found among them is not in the shape of the eggs, or the forms and habits of the caterpillars, or the forms of the chrysalids, but merely in the behavior of *myrina* as regards the second brood, each of the others being, so far as is yet known, single brooded.* And neither in the preparatory stages nor in the butterflies themselves do I see any reason for separating *myrina* and the smaller species from the genus *Argynnis*, or making more of them than a group. A group is as expressive as a genus, and a genus with its groups should present at one view an entire class with all its families, inter-related, though in differing degrees, as having had a common ancestor, and any system of arrangement which elevates what are properly groups into independent genera, destroying the unity of the class, strikes me as unnatural, and therefore unphilosophical.

But in passing we may as well look into the facts about this genus *Brenthis*—*Brenthis* Hübner (Scud. Syn. List, 1875) and learn something about the manufacture of modern genera.

The species *myrina* is closely like *euphrosyne* of Europe, and congeneric with it, no matter how *Argynnis* be split up. Hübner, in his Verzeichniss, amused himself with assorting the known butterflies into batches or parcels, as a child would sort his alleys and taws, by color, stripes and shape, putting blues into one lot, browns into another, one-striped into a third, two-striped into a fourth, regardless of characters which would be generic, that is. *which would indicate blood relationship or a common descent.* It is a very rare thing to find one of his batches —which he called a coitus, meaning a batch or assemblage, and which is in no sense a genus, for the element of common descent does not enter into this whimsical system—co-extensive with a genus. It is by the merest chance if it is so. Nor does the coitus correspond with a natural

* Though there are some reasons for suspecting that in West Virginia the other species must be double brooded also. That, however, is not determined, and I do not assume it. But this difference in the same genus as regards the number of broods, supposing it exists in *Argynnis*, is paralleled by the *Apaturas celtis* and *clyton*, the former being here double, the latter single brooded.

group under a genus. At first sight it may sometimes seem to do so, the species being assorted in twos and threes, but it will be found that whether the coitus embraces two or twenty species, the butterflies under it are most likely such as belong to distinct genera, and sometimes so distinct that one hundred or two hundred pages of Kirby's Catalogue separate them. And an instance of this mis-assortment is found in the coitus *Brenthis*. Under this head are ranged five species, viz., *hecate*, *dictynna*, *thore*, *daphne* and *claudia*, the latter as much out of place in such company as a horse in a drove of asses. But the horse is dapple and the asses are dapple, each has one tail and two ears, and behold a Hübnerian coitus! The definition of *Brenthis* is "the hind wings below gaily clouded, pale spotted," and it is ranged under the first family of the fifth stirps. This family is called Reticulatæ, and embraces two coitus only, viz., *Phyciodes*, under which our *tharos* comes, and *Brenthis*. The definition of the family is thus given: "The wings above striped like a grating; the hind wings below spotted with colored spots on a pale yellow ground, marked with eye-like spots." *Thore*, an European species very much like our *bellona*, and congeneric with it as *myrina* is with *euphrosyne*, is placed in *Brenthis*, along with *claudia*, and these are separated from the batch which includes *myrina*, *not merely by the limits of a coitus*, *but of a family even*, *in order to get them among the Reticulatæ by the side of tharos*. This next family, the Phalaratae, is thus defined: "The wings differently spotted, the under side ornamented with pearl-colored spots." And the first coitus under it is *Argynnis*, the definition of which is: "the hind wings below variegated, spotted with shining white." Under this coitus comes *euphrosyne*, and therefore *myrina*, included in this loose definition solely because it has white spots. Two more coitus are made, called *Issoria* and *Acidalia*, which include the larger species of *Argynnis* (not Hübner's), *lathonia*, *cybele*, *diana*, &c. Of these absurd divisions, Mr. Edward Doubleday (Remarks on the genus *Argynnis*) says: "they are so unnatural that they can in no case be adopted."

But suppose these batches were not unnatural, but were co-extensive with genera, how comes *myrina*, which, as it agrees with *euphrosyne*, is placed by Hübner under *Argynnis*, filling in some little degree the requirements of that coitus, to be remanded to the coitus *Brenthis*, which belongs to another family even, placed along side of *Phyciodes tharos*, and the requirements of which coitus it does not fill at all? It is an unwarranted use of Hübner's name, applying it to what he expressly says it shall not be applied. It is taking one of his blue taws and dropping it among the

striped ones, doing violence to all his notions of symmetrical arrangement. He would have rejected the blue taw with abhorrence. What does the word "*Brenthis* Hübner" mean, if not that the genus *Brenthis* was created by Hübner, and that his definition includes the species sought to be placed under it? If it has any other meaning I am ignorant of it, and if it does mean that it is false. This is a fair sample of the uses to which Hübner's absurd and worthless Catalogue has been put. Very few Lepidopterists in this country know anything of Hübner's books, and most are disposed to accept in some degree the dicta of any one who sets up to reform the nomenclature. But if reform be needed, which is very questionable indeed, it is not to be brought about by lugging Hübner into the arena. To go back at this time of day to the Verzeichness is to go back to the balls and tops and games of school-boys.

NOTE ON DATANA PERSPICUA G. & R.

BY A. R. GROTE, BUFFALO, N. Y.

Since the original illustration and description of this species, ten years ago, in the Proceedings of the Entomological Society of Philadelphia, it has not been noticed, except by the late Mr. B. D. Walsh, in the same Proceedings, vol. 5, p. 194-5. I have been since last year indebted to Prof. C. V. Riley for a number of specimens of *perspicua*, raised from larvæ found on Sumach. It is enough to say that the specimens bear out the specific validity of a form which is perhaps the most easily recognized among the difficult species of this genus. I was able to separate the imagos of a number of the species bred by Prof. Riley, by the characters laid down by the late Mr. Robinson and myself in our revision of the genus. Specimens of *contracta*, *integerrima*, *ministra* and *perspicua* were sent me by Prof. Riley; no true specimens of *angusii* were included. I observed the larva of *integerrima* at Detroit, August 13, and again on Grand Island, Niagara River, Aug. 19, apparently nearly full grown. I have not had hitherto any specimens of *perspicua*, before receiving those sent me by Prof. Riley, who will, I hope, give us some observations on the genus before long. I am glad also to be able to find that the facts

relieve us from the imputation of having described "not the *species*, but the *individual*," placed upon us by the late Mr. Walsh in the case of *D. perspicua*. And as to the "very limited number of specimens," the argument which covers two pages seems to have been compiled almost wholly from Fitch and other writers who mixed up a variety of forms under the name of *ministra*, and who, in consequence, cannot be considered as any authority on the subject. I have yet to see imagos of *Datana* which I cannot refer to one or the other of the forms in this genus, which are separable also on larval characters. It matters little whether we call these forms "species" or "varieties," so far as the advisability of according them different Latin designations is concerned.

NOTES ON CERTAIN SPECIES OF ARCTIA.

BY A. R. GROTE, BUFFALO, N. Y.

Arctia arge (Drury).

A male specimen taken by the late Mr. C. T. Robinson, at Brewster's, N. Y., varies by the fore wings being black, the veins broadly bordered by flesh color. The ordinary triangulate black interspaceal markings have all fused. Hind wings shaded entirely with blackish, none of the usual spots being visible. Beneath as above. Body as in the type.

Arctia Anna Grote.

Contrary to Mr. Stretch's remark, two specimens of this species occurred in Penn. One is in Dr. Packard's collection, and is recorded by him in his Synopsis. The markings of the fore wings prevent the idea that it is a "melonotic" var. of *Persephone*, as suggested by H. Strecker. *Persephone* Grote was described *after* this species; I supposed at first the two belonged as ♂ and ♀, only one sex of each being known to me. More material is needed to decide these points, bare opinions being useless and offensive.

Arctia Michabo, n. s.

♀. Belongs to the series of *virgo*, *Saundersii (intermedia)*, *Edwardsii*, *Blakei*. The size is next to *Saundersii*. It is like *virgo* in having black spots on the middle of hind wings, one rounded one on the median vein

within and below the rounded discal spot ; below this, on internal vein, is another sub-obsolete spot. The sub-marginal spots are very large irregularly triangulate ; the marginal spots are limited to two superiorly, which do not tend to run along the edge of the wing as in allied forms ; the fringes are but little paler than the rosy wings, which are more diaphanous than in its allies. Fore wings like *Saundersii* in having linear venular markings ; the bands are like that species, the color is more pinkish, the discal stripe much broader. Beneath both wings alike roseate, with the black markings repeated. Thorax and head like its allies ; the breast is however, pink, and the legs spotted with pink and not wholly blackish. Costa of fore wings without black markings beneath. *Expanse* 43 m. m. Nebraska, Mr. Dodge.

Arctia intermedia Stretch.

My specimens from Belfrage lead me to suppose a different species from that illustrated by Mr. Stretch, whose figure seems to me undoubtedly to represent *Saundersii*. It is probable that a number of specimens sent by Belfrage belong to a different species from that sent to Mr. Stretch, and I provisionally propose the name *Stretchii* for the following form. It differs from *intermedia* and *Saundersii* by the presence on the fore wings of an inner sub-basal transverse band, narrowing at median vein, broad below the longitudinal stripe. On hind wings *all* the spots much reduced. The anus is not black at the sides. Oct. 7, 10. Dr. Harvey has recently referred specimens of this form to *Saundersii*.

Arctia Snowi, n. s.

♀. Habit of *nais*, of which I thought it at first an extreme variety, but the fringes on both wings are wholly black. Head, thorax, legs, wholly black ; abdomen crimson at sides. Wings wholly black. A crimson discal rounded lunule, narrowly yellow edged ; a short broken transverse bar, similarly colored, opposite the disc. Hind wings with a moderate crimson lunulated spot outwardly towards the apices. Beneath as above, a dash above the discal spot. *Expanse* 38 m.m. Kansas, Prof. Snow.

DESCRIPTION OF A NEW HADENA FROM THE WHITE MOUNTAINS.

BY H. K. MORRISON, CAMBRIDGE, MASS.

Hadena ancocisconensis (nov. sp.)

Expanse 40 m. m. Length of body 16 m. m.

Eyes naked, with short lashes. Antennæ in the female simple. Palpi gray, the third joint very short. Collar whitish beneath, above bearing a transverse, partially interrupted black line. Thorax mingled light and dark gray; no prothoracic tuft, metathoracic tuft low and longitudinally furrowed; sides of the thorax deep black and very conspicuous. Abdomen light gray, with several slight dorsal black tufts, and one very strong one, tipped with white on the third segment. Tibiæ unarmed. Anterior wings having the basal space light gray, whitish at the base, and contrasting with the thorax and a black acute basal dash; inner margin of the wings white near the base, this white space is bounded above by another basal dash, finer than the one last mentioned; median space darker gray; the ordinary spots are of the usual shape, faintly outlined in black and filled with light gray, which extends around and beyond them, but less distinctly; interior line simple, black and very acutely dentate, forming inferiorly two very long teeth, the upper of which is connected by a black dash with the exterior line; the latter is well removed towards the outer margin, obsolete above, below it appears as an oblique black line, followed by a distinct white shade, this is followed by another thicker black line, slight traces of the subterminal line otherwise obsolete, and another white dash before the angle, enclosing a black spot; a series of black dashes in the terminal space, three of which are united, forming the usual W-shaped marking; the white subterminal shade line extends sometimes around this marking. Fringes gray, with white points at the terminations of the nervules. Posterior wings gray, darker towards the margin. Beneath gray, nearly unicolorous, without the usual median line.

Hab. Glen Valley, Mt. Washington, N. H.

Described from a specimen in my collection, taken at sugar in August.

The alternation of black and white at the inner angle makes this species very easy to recognize; it differs in this respect from all other members of the genus.

THE LUNA MOTH *(Actias luna)*.

BY R. V. ROGERS, KINGSTON, ONT.

As supplementary to my remarks on this pretty creature in the August number of the CAN. ENT., I would say that on June 6th a friend gave me a captured female Luna. For two or three nights I used her as a trap to entangle unwary males, but in vain as far as my cabinet was concerned; the weather was cold. On the 7th, 8th and 9th, during the silent watches of the night, she deposited in her place of confinement, in all, about 100 eggs of a dark brown or chocolate color, flattened at the sides, smooth and about .005 of an inch in length; the sides were of a lighter shade. On the 13th the moth died, having accomplished the end of her existence. On the 20th the first little larvæ appeared, having made their escape by eating an oval opening in the end of the shell; the inner surface of the egg now appeared perfectly white. The caterpillars were about .02 of an inch in length; head black, greenish on top and yellowish in front; the body black, with two yellow spots on each segment, and having numerous yellow hairs; the under part of the body and feet and legs were of a light yellow. Some crawled about with the empty shell on their tails, others carried it as an umbrella over their heads, but the majority seemed to discard it at once. The first day they were in a dark box, and they seemed very restless and would eat nothing; the next day I put them in a box with a glass cover, and they at once settled down contentedly to their life-long work of eating their daily bread. Others were born on the 20th and 21st. I fed them on elm leaves. On the 27th they had grown to over a third of an inch in length, and now the warts upon each segment were apparent, and the little hairs upon them were also visible.

On the 30th they began to change their skins; the head and body were now of a light green, with yellow warts on each segment; the hairs were neither as numerous or as distinct as before; there were a few dark ones on the front segments.

On the 4th of July the length of the largest was .45 in.; on the 11th, .6 in.; on the 13th they moulted a second time, and on the 18th they had attained the length of almost an inch.

Unfortunately, the food, the weather, the close watching, the narrow confinement, or something or other, did not agree with these unfortunate caterpillars, and one by one they would suddenly die, and my attempt to reap a rich harvest of cocoons was utterly foiled, and I succeeded in getting—not one; although up to the very day of their death they would eat the elm leaves apparently with great gusto: it was difficult for me to get a change of diet for them.

ON A NEW EUCHAETES.

BY A. R. GROTE, BUFFALO, N. Y.

Euchaetes Spragui, n. s.

♂. Allied to *elegans*, but entirely stone color, like *egle*.

Fore coxae, head at base, two thoracic vittae, costal and internal margin of fore wings crimson. Abdomen above bright red, with dorsal black dots.

Kansas (Prof. F. H. Snow).

I name this beautiful species, which is of the same size as *elegans* and *Oregonensis*, after my friend Mr. Henry S. Sprague, of Buffalo, N. Y.

BOOK NOTICES.

Injurious Insects of Michigan, by A. J. Cook, of the Michigan State Agricultural College, 8vo., 48 pages, with numerous cuts. We are indebted to our esteemed friend Cook for a copy of this excellent report, in which is contained a concise summary of most of the facts known relating to the life history of a large number of our most injurious insects, with the best means of subjugating them. It is intended as a practical hand book to guide the agriculturists of Michigan, a purpose it is well qualified to serve.

We have also received from the same author a copy of an address delivered by him on *Phylloxera vastatrix*, at Munroe, Mich.; 8vo., pp. 10, with illustrations.

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The Canadian Entomologist.

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THREE NEW GALLS OF CECIDOMYIÆ.

BY C. R. OSTEN SACKEN, CAMBRIDGE, MASS.

I hardly need an apology for presenting from time to time to the entomological public descriptions of galls of *Cecidomyiæ*, even when I did not succeed in rearing the fly. Such observations, unless published soon, are very apt to be lost; once published, they gradually accumulate and furnish a welcome material for the future monographer. To facilitate reference, I give here a list of my previous publications on the galls of North American *Cecidomyiæ*:—

1. On the N. Am. *Cecidomyiæ* (In the Monogr. N. A. Diptera, vol. I, p. 173—205).

2. *Lasioptera*, reared from a gall on the Golden-rod (Proc. Ent. Soc. Phil. 1863, p. 368—370).

3. Two new N. A. *Cecidomyiæ* (Proc. Ent. Soc. Phil. 1866, p. 219—220).

4. Biological notes on Diptera. Article first: *Asphondylia monacha*, n. sp., and other galls on Solidago (Trans. Ent. Soc. Phil. 1869, p. 299—303). Article second: A new Amer. *Asphondylia*; On some undescribed galls of *Cecidomyiæ*. Article third: A *Cecidomyia* living in pine resin (Diplosis resinicola, n. sp.); a gall of *Cecidomyia* on Wild Cherry; additions, corrections.

Cecidomyia (tiliæ) *verrucicola*, n. sp. Wart-shaped, round, pale green galls, 3—4 millim. in diameter, projecting on the upper and underside of the leaves of the linden. They occur between the ribs and veins and often upon them. In autumn they become brown, hard and woody, and spring open on the underside, a circular piece detaching itself and either falling to the ground, or remaining fastened to the gall by a small portion of its circumference, in the shape of a lid. Inside of the gall, when green, there is a low-roofed cavity, containing a white larva, with a distinct

breast bone, heart-shaped anteriorly, and ending in an elongate point posteriorly. The dry galls are empty. I found them common on Goat Island (Niagara Falls), on the hills near West Point, N. Y., in Cambridge, Mass., etc., in August and September, on the young shrubs of the linden.

Cecidomyia (urticæ) *urnicola*, n. sp. Galls on the upper side of the leaves of *Urtica gracilis*, either on the midrib, or, more often, on the lateral veins. Urn-shaped (I mean the shape produced by cutting off the smaller end of a slender pear) up to 3 m. m. high, subsessile (that is, connected by a very small surface with the leaf), pale green, semi-transparent, succulent gall, bearing a short style or nipple at the upper, truncate end. Inside, the larva of a *Cecidomyia*. Lake George, July, 1863; Trenton Falls, July, 1874; not uncommon, but not in large numbers. Each leaf bears one, sometimes two galls, seldom more.

The gall produced by a *Cecidomyia* on the European nettle, and described by Perris, Ann. Soc. Ent. France, vol. IX, p. 401, is different from the present gall.

Asphondylia (asteris) *recondita*, n. sp. Deformed terminal buds on the principal and the lateral branches of *Aster patens*. These galls consist merely in an arrest of growth and consequent accumulation of leaves, forming a bud-like body up to 10 or 15 m. m. in length. Inside I found pupæ which their structure proves to be those of *Asphondylia*. The horn-like, sharp projections on the head are contiguous here, precisely as in *Asphondylia sarothamni*, figured by Winnertz (Linn. Entomol. vol. VIII, Tab. I, f. 6). I found these galls on Lloyds Neck, Long Island, in September, but did not succeed in rearing the fly.

ON NORTH AMERICAN SPECIES OF PLUSIA.

BY A. R. GROTE, A. M., BUFFALO, N. Y.

Plusia monodon, n. s.

Allied to *precationis* and *gamma*. It differs by the distinct yellow shaded geminate t. p. line having but a single acute tooth at vein 2; the line running more outwardly at this point, and being otherwise even throughout. Also by the shape of the metallic spot; this is open, silver

bordered, running outwardly obliquely from the median vein to the t. p. line at vein 2, sub-triangulate, the bordering lines fusing outwardly to a point, forming an oblique uneven V. The median space below and beyond the metallic mark is shaded longitudinally with obscure chalceous. The reniform is a narrow angulate dark lunule. The orbicular incomplete, whitish edged. The subterminal is more dentate than usual, and shaded anteriorly with dark brownish, with a golden reflection inferiorly. The median space is dark brown above the metallic mark and below the median vein and the base of vein 3 ; also inferiorly. The ground color is a purple gray shaded with brown. The t. a line is even, rounded, distinct, like the t. p. line in color. Hind wings rather pale, with blackish hind borders ; beneath pale grayish, not yellowish, and without the lines of *precationis*.

Expanse 36 m. m. Cape Breton. From Mr. Roland Thaxter.

Plusia pseudogamma, n. s.

Like *gamma*, but with a more contrasted color of fore wings. The t. p. line more rounded opposite the cell, succeeded by a white shading which appears again over internal angle without the s. t. line. The metal mark is like *gamma*, but broader and pure silvery. The space about the spot is shaded with deep brown. Inferiorly the median space is entirely chalceous. The t. p. line is stained with reddish and the inward tooth opposite the extremity of the metallic mark is deeper than in its ally. The s. t. line is less dentate than usual, preceded by a chalceous and brown shading. Hind wings pale gray with blackish borders. Abdomen with dorsal tufts. Beneath obscure gray, unlined. This species has a strangled reniform with narrow pale annulus, like *gamma*, while the orbicular is less conspicuous and the t. p. line is more even superiorly than in its ally.

Expanse 42 m. m. Cape Breton. From Mr. Roland Thaxter.

Plusia Dyaus, n. s.

Between *verruca* and *precationis*. Ground color pale olive-lilac gray. Collar and face of dorsal tuft olivaceous. Metallic spot an obtuse silver open mark, succeeded by a well sized detached silver spot. Orbicular with a pale shaded annulus, inconspicuous. Reniform incomplete, with a deep outer constriction and here outlined in pale gold, the annulus being perceivable inferiorly ; beyond the reniform the cell is chalceous and inferiorly the median space is golden shaded, the wing about the metallic

marks being olive brown. Terminally the wing is washed with pale golden and there are two deeper golden shades resting on the whitish terminal line below the apex, the lower triangulate. The s. t. line is also superiorly preceded by darker shades. The ordinary lines are pale golden. Fringes pale, dotted at base, with a more prominent black dot opposite vein 3 and the triangulate deeper gold mark. Hind wings largely blackish fuscous, with pale fringes. Beneath with double lines. Nearest to *precationis*, a little smaller, paler, not purple colored, the median space all golden inferiorly.

Expanse 34 m. m. Texas, Belfrage, Nov. 2, No. 142.

Also from Jamaica, Mr. Thaxter, No. 2,076.

It may be distinguished from *verruca*, also, by the subterminal line not forming a broad tooth apically below costa, but being here rounded to the sinus opposite the cell.

Plusia pedalis, n. s.

Allied to *gamma* and *ou*. Hind wings wholly blackish fuscous, with whitish fringes lined at base. Fore wings more uniformly dark colored with the ornamentation of *ou*, but with the yellowish open metallic mark short, broad and somewhat foot-shaped, without any accompanying dot. Beneath dark, with median common line.

Expanse 36 m. m. Kansas, Prof. Snow, No. 273.

The following is a list of our North American species, following the method of Dr. LeConte's Catalogue of N. A. Coleoptera, adopted in Part 1 of the List of North American Lepidoptera by the late Mr. Coleman T. Robinson and myself, published in Philadelphia, Sept., 1868.

Plusia *Hubn.* (1806).

Type, Plusia chrysitis of Europe.

1—purpurigera *Grote.*
Dera purp. Walk.
2—aerea *Guen.*
Agrapha aerea Hübn.
3—aereoides *Grote.*
4—balluca *Guen.*
Dyachrisia ball. Geyer.
5—metallica *Grote.*
Pl. bractea ‡ Grote.
6—contexta *Grote.*
7—Putnami *Grote.**
8—striatella *Grote.*
9—formosa *Morr.** *
Leptina form. Grote.
10—thyatiroides *Guen.*
11—mappa *G. & R.*
12—bimaculata *Steph.*
Pl. u-brevis Guen.

13—biloba *Steph.*
14—verruca *(Fabr.)*
15—Dyaus *Grote.*
16—precationis *Guen.*
17—laticlavia *Morr.*—
18—labrosa *Grote.*
19—monodon *Grote.*
20—pseudogamma *Grote.*
21—gamma *(Linn.)*
22—ou *Guen.*
23—fratella *Grote.* * * *
24—u-aureum *Boisd.*—
25—pedalis *Grote.*
26—brassicæ *Riley.** * * *
Pl. ni ‡ Grote.
27—oxygramma *Guen.*
Autographa oxygr. Geyer.
28—mortuorum *Guen.*
29—8-scripta *Sanborn.*
30—viridisignata *Grote.*
viridisigma Grote.
31—epigaea *Grote.*
32—ampla *Walk.*
33—simplex *Guen.*
34—pasiphaeia *Grote.*
35—diasema *Dalm.*—
36—parilis *(Hubn.)*
37—alticola *Walk.*
38—Hochenwarthi (*Hoch.*)
Noctua divergens Fabr.
39—devergens (*Hubn.*)—

The following species cannot as yet be identified from published data concerning them: Plusia flagellum, indigna, selecta, secedens of the British Museum Lists; Plusia falcigera and rectangula of Kirby; Noctua omicron of Linné.

ON SCOPELOSOMA AND ALLIED GENERA.

BY A. R. GROTE, BUFFALO, N. Y.

Eucirrœdia, n. g.

The shape of the fore wings is like *Scoliopteryx*, and the ornamentation is like that genus, while the stigmata are well defined, the course of the lines being similar in the two genera. This is a much more robust form

* This species seems to vary in color; one specimen is very like *festucae* in this respect. A character is offered by the t. p. line, which runs inwardly to a point below the discal dot in *festucae*, and allows of an extension of the silvering within this tooth. In *Putnami* this sinus is rounded and shallower.

** Unknown to me since 1866, when I described the species and at once returned the type to my friend Mr. Treat; I indicated at the time the structural difference in the length of the palpi. Both this species and *thyatiroides* are apparently mimetic of the Bombyciæ.

* * * Contrary to Mr. Morrison's supposition, I regard this as a valid species, differing specifically from the larger *P. ou*, taken by myself in Alabama. The t. p. line is straighter, the dot of the metal mark is separate, the size is uniformly smaller.

* * * * Dr. Speyer regards this species as valid on new characters; a Californian specimen does not differ from my Eastern material.

than the European *Atethmia xerampelina*, and has different shaped, more dentate primaries. Eyes naked, tibiae unarmed. *Eucirroedia pampina* (Guen.) has the colors of *Fodia*. I would restrict *Xanthia* in North America to the species *X. togata* (silago), also found in Europe; the genera might follow in this manner : *Glaea*, *Xanthia*, *Fodia*, *Eucirroedia*, *Scoliopteryx*, *Scopelosoma*, *Lithophane*. I, at one time, identified *X. aurantiago* Guen., but have now no specimens before me.

Scopelosoma.

The North American species are now eight in number, *sidus* Guen. being unknown to me, unless the latter is = *vinulenta*. The difficulty has arisen in that *Walkeri* varies in color, so that certain specimens seem to accord with M. Guenee's comparative description of *sidus* as well as *vinulenta* does. However, I am persuaded that it is more probable that *sidus* is founded on an individual of *vinulenta*, as I at first believed, and I only wait some more positive data to restore the name. It is necessary for the purpose to compare M. Guenee's type. The N. Am. species are then as follows :

Pettiti Grote, *Graefiana* Grote, *ceromatica* Grote, *vinulenta* Grote *(= sidus ?)*, *Walkeri* Grote, *Morrisoni* Grote, *devia* Grote. No species are yet known from California.

Litholomia, n. g.

In the shape of the primaries there is a marked resemblance to *Lithophane* and *Scopelosoma*, the costal margin being straight. The inner margin is straight and nearly as long as the costal, the exterior margin being slightly and evenly rounded ; the wing is nearly of an even width throughout. The tibiæ are unarmed. The eyes are naked, lengthily lashed. The head is sunken, or oppressed. The male antennae simple, ciliate beneath. The thorax is somewhat rounded and full, approaching *Lithomia*, not quadrate as in *Lithophane* and *Calocampa*. The abdomen is untufted, somewhat flattened, with a dorsal carina, not as rounded as in *Lithomia*. The palpi are short, not exceeding the front. Ornamentation like *Lithophane* and allied genera.

Litholomia napaea.

Antennae white at the base. Cinereous ; markings distinct. Lines double, black, distinct, perpendicular. T. a. line thrice waved, component lines divaricate, equally distinct. Orbicular shaded with white,

ill defined, below it a very narrow line descends towards internal margin beyond; the distinct, slightly waved, broad, median shade line crosses the wing; this line is accompanied by a diffuse shading which in one specimen is tinged with ferruginous. Reniform filled with blackish, forming a larger rounded inferior spot. T. p. line nearly perpendicular, very slightly exserted opposite the cell, the inner line extending outwardly dentatedly on the veins. Subterminal line irregular, whitish, preceded by a blackish shading, denticulate. An even black terminal line, obsoletely interrupted; fringes even, gray, dotted with blackish. Secondaries blackish fuscous with paler fringes. Beneath paler fuscous, with blackish discal spot and median, irregular, denticulate line; on fore wings the median line is distinctly and broadly inaugurated in deep black, near the discal mark, but afterwards becomes obsolete; terminal space paler than the rest of the wing. Collar with a black line above; behind, on the dorsum are two more faint lines across the base of the tegulae.

Expanse 27 m. m. *Hab.* St. Catherines, Mr. Geo. Norman, No. 226, 1115; Quebec, M. Bélanger.

Identified by Mr. Morrison, from a photograph, as his *Scopelosoma napaea.*

AGROTIS RUBIFERA, N. S.

BY A. R. GROTE, BUFFALO, N. Y.

Allied to *rubi* and *conflua.* Taken by Mr. Norman in Canada, and considered to be identical with the European *rubi* in former writings. Abdomen and hind wings paler than in *conflua.* Fore wings of a darker purply-reddish brown; t. a. line geminate, a black spot before the orbicular and usually the disc between the spots is black stained. Claviform indicated. Subterminal pale, more waved, but like *conflua*, differing from *rubi;* beneath the common line is not diffuse as in *conflua.* Thorax darker than fore wings, with front and palpal tips pale. *Expanse* 28 m.m.

Dr. Speyer, to whom I sent a specimen, regards the species as different from *rubi*, but finds no characters to separate the European *Xanthia togata* from a N. A. specimen determined as this latter species, sent to him at the same time.

LEPIDOPTERA COLLECTED AT GODBOUT RIVER, NORTH SHORE OF THE ST. LAWRENCE, DURING THE SEASONS OF 1874–75.

BY NAPOLEON CORNEAU, RESIDENT.

Papilio brevicauda *Saunders*.....9th June, rare.
" turnus *Linn*.....20th June, rare.
Pieris rapæ *Linn*.....26th June, rare.
" borealis *Scudder*.....22nd June, uncommon.
Colias interior *Scudder*.....15th July, rare.
" philodice *Godt*.....14th July, rare.
Vanessa antiopa *Linn*.....2nd June, common.
" J-album *Bois*.....22nd Sept., rare.
" Milberti *Godt*.....29th May, rare.
Pyrameis atalanta *Linn*.....5th July, common.
" huntera *Smith*.....15th July, rare.
" cardui *Linn*.....24th June, rare.
Argynnis atlantis.....15th July, common.
" myrina.....7th July, rare.
" bellona.....8th June, rare.
Melitaea tharos var. Batesii.....16th July, common.
Limenitis arthemis *Godt*.....15th July, common.
Grapta progne.....29th May, rare.
Lycaena lucia *Kirb*.....11th June, common.
Glaucopsyche Couperi *Grote*.....23rd June, common.
Hesperia mandan *Edw*.....July, rare.

Good specimens of the above can be obtained from William Couper, 67 Bonaventure Street, Montreal.

NOTES ON THE LARVA OF CATOCALA ILIA, Cram.

BY F. B. CAULFIELD, MONTREAL, P. Q.

On June 15th, 1874, Mr. Wm. Couper, while collecting on Montreal Mountain, found a larva on Oak, which he kindly gave to me. It appeared fully grown, and was a little over two inches in length.

Body onisciform ; general color, gray. Head heart-shaped, strongly bilobed, pale green, with white blotches, twelve short black hairs in front, and near the top of the head there are four small tubercles of a white color, each of which is tipped with a black hair ; head surrounded with a broken border of dark streaks. Upper surface greenish gray, with an interrupted dorsal band of delicate blue gray spots, the whole minutely spotted with black. On the second segment are twelve small white hairs, four on fourth, fifth and sixth, six on seventh, four on eighth to twelfth, six on thirteenth. Sides delicate blue gray, marbled with spots of green and black, with a broken lateral band of a green color ; spiracles yellowish white, with a black ring ; behind each is a large wart tipped with a black hair. A fringe of short white fleshy filaments close to under surface. Under surface pink, with a row of transverse black spots, larger and darker on the middle segments. Feet and prolegs grayish white, spotted with green and black.

This larva was very sluggish during the day, but would fling itself about in a frantic manner if touched ; at night it was very restless, creeping about the box continually. It fed freely on Oak.

Spun up in a leaf June 18th, 1874. Imago emerged latter end of July, 1874, and proved to be *Catocala ilia* Cram.

TINEINA FROM CANADA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from p. 147.)

GELECHIA.

G. albomaculella. N. sp.

A single specimen with the palpi broken off. Head pale yellowish tinged with fuscous. Thorax brown, with the apex whitish. Fore wings gray brown, under the lens appearing yellowish white and brown in irregular blotches, with a distinct white spot on the fold at about the basal fourth, the usual opposite white costal and dorsal spots at the beginning of the ciliae, a small white spot at the apex, and two others at the base of the dorsal ciliae. Ciliae sordid white, with a narrow brown hinder marginal line about their middle. Legs and abdomen beneath irregularly blotched with yellowish gray and dark brown. *Al. ex.* 1⅛ inch.

G. niveopulvella. N. sp.

Palpi simple; third joint slender and longer than the second, dark brown; the second hoary at the tip; the third whitish on the upper surface at the base. Head brown, dusted with white, with a row of white scales across the forehead between the eyes. Antennae brown. Thorax brown, densely dusted with white, especially about the middle, where the white prevails. To the eye the fore wings appear very dark brown, with a white spot on the disc before the middle and two or three small ones behind the middle, and an irregular white fascia posteriorly angulated at the beginning of the ciliae; under the lens the wing appears to be pretty densely dusted with white and the spots are only aggregations of the dusting. Under surface and legs irregularly marked with dark brown and gray, and the tarsi are annulate with white. *Al. ex.* $\frac{13}{16}$ inch.

G. bicristatella. N. sp.

Palpi simple, second joint as long as third, and white on the inner surface and tip; outer surface dark brown; third joint ochreous, with a dark brown annulus about the middle. Antennae ochreous, annulate with brown. Fore wings pale ochreous, dusted and suffused with brown. There is an oblong tuft of dark brown raised scales on the fold, and a short brown streak between it and the dorsal margin. Another tuft of brown scales at the end of the cell, and the apical part of the wing is dark brown. Ciliae stramineous, with a narrow brown hinder marginal line about the middle of those of the dorsal margin. *Al. ex.* $\frac{9}{16}$ inch.

G. Belangerella. N. sp.

Second joint of the palpi a little swollen towards the apex, and the third as long as the second; second joint pale gray, third pale ochreous with a brown annulus before the middle and another before the tip. Head gray. Antennae brown. Thorax and fore wings gray, with a dark brown streak along the fold and two or three small spots about the middle of the wing and two more at the end of the cell slightly raised above the surface. There is a row of eight blackish spots around the apex. Hind wings somewhat sinuate beneath the tip, pale grayish fuscous. Legs dark brown; tarsi annulate with white. *Al. ex.* $\frac{9}{16}$ inch.

LEUCOPHRYNE., *gen. nov.*

Second joint of the labial palpi three times as long as the short conical third joint; the second joint projects nearly straight in front of the

head, and is clothed with loose, somewhat spreading scales at its apex, but can scarcely be called tufted; the third joint is slightly recurved. No maxillary palpi; tongue scaled and of moderate length. Face full, wider than long, somewhat retreating. Eyes globose, moderate. Vertex short. Antennae simple (as in *Gelechia*).

Fore wings lanceolate. Cell rather narrow, closed. Four marginal veins proceed to the costal margin, the first from about the middle of the cell and much longer than the others, which proceed from the apical part of the cell, the fourth being furcate on the costa before the apex; the median sends four branches to the dorsal margin, the last of which attains the margin near the apex, opposite to the last subcostal marginal vein; submedian furcate at the base; the costal attains the margin before the middle. There is nothing in the fore wings to separate it from *Gelechia*.

Hind wings lanceolate, narrower than the fore wings, resembling in form and neuration the wings of *Holcocera*, and yet more those of *Plutella cruciferarum*. The costal vein attains the margin before the middle; the subcostal proceeds straight to the margin before the apex; the discal vein does not touch the subcostal, but terminates at its superior branch, which behind the end of the cell is connected with the subcostal by a very short transverse veinlet, immediately behind which it becomes furcate, delivering both branches to the dorsal margin before the middle; anteriorly it runs through the cell, parallel and close to the subcostal, but becomes obsolete before it reaches the middle of the cell. The median is three-branched and rounds gradually into the discal, which rounds up anteriorly to its superior branch. Submedian distinct.

L. tricristatella. N. sp.

Palpi reddish brown, sparsely dusted with white, which forms three very narrow and indistinct annulations on the third joint. Face pale yellowish, iridescent. Head and thorax reddish brown. Patagia and basal portion of the dorsal margin of fore wings ochreous yellow, with a small reddish brown tuft within the dorsal margin of the wing, not far from the base; remainder of the wing dark reddish brown, with a large erect tuft on the fold about midway the length of the wing, and a transverse tuft covering the discal vein. Ciliae of mixed brown and whitish scales, and paler than the wing. Legs brown, the tarsi annulate with whitish. The posterior tibiae with a whitish spot about the middle of the outer surface and the tip white. *Al. ex.* ¾ inch.

TINEA.

T. marmorella. N. sp.

Head and palpi yellowish white ; the second joint of the palpi brown on the outer surface. Thorax and fore wings white, marbled with dark brown spots, which are confluent, the basal fifth being white, except a brown spot on the base of the costa, one on the base of the dorsal margin, one on the fold and one between it and the dorsal margin ; in the remainder of the wing the brown prevails ; one of these dark brown spots is on the costa before the middle and reaches the fold, and another about the middle of the costa does not quite reach the fold, and behind it along the costa and around the apex is a row of distinct and separate dark brown spots, five of which are on the costal margin. There is a dark brown hinder marginal line extending through the middle of the dorsal ciliae, and the ciliae behind it are dusted with black. *Al. ex.* ⅜ inch.

T. minutipulvella. N. sp.

Outer surface of the second joint of the palpi dark brown. Palpi otherwise and the head white, with a sordid brownish spot between the antennae. Antennae yellowish white, annulate with brown. Thorax and fore wings white, minutely but distinctly dusted with pale brown, the dusting along the costa aggregated into minute brown spots, and also along the base of the dorsal ciliae, which are white flecked with pale brown. Hind wings grayish fuscous. Dorsal surface of the abdomen grayish brown, with a distinct dark brown line along each side. Under surface whitish ; tip pale sulphur yellow. Legs brown on their anterior surfaces, whitish behind and the tarsi annulate with white. *Al. ex.* ⅝ inch.

T. marginimaculella. N. sp.

Outer surface of the palpi brown ; inner surface and face white ; vertex pale sulphur yellow, or, perhaps, rather deep stramineous. Maxillary palpi grayish white. Antennae silvery gray. Thorax and base of the costal portion of the wing brown, that color also being extended as a streak or series of spots along the fold to the dorsal margin and at the base of the dorsal ciliae. There are four brown spots on the costal margin, the last of which is placed at the beginning of the ciliae, and a row of brown spots extends at the base of the ciliae entirely around the apex ; there is a dark brown spot on the middle of the disc and another at the end of the cell. Ciliae and hind wings silvery pale gray. Abdo-

men brown, the apex silvery. The first pair of legs is brown on the anterior surface, and the tarsi are annulate with white. Middle and hind legs silvery gray. *Al. ex.* ½ inch.

In former pages of this journal I have described a few other species from Canada among species from the United States. In all of these instances the *habitat* is given, except in the single instance of *Œcophora boreasella*, where I find that I have omitted it. The single specimen from which it was described was unfortunately destroyed while under examination. It was received from Mr. Saunders, Editor of this journal, and was labelled No. 399. I do not know whether Mr. Saunders has other specimens or not.

(The specimen sent Mr. Chambers was the only one in my possession.—W. S.)

NOTES ON AN INTERESTING EASTERN VARIETY OF ONCOCNEMIS CHANDLERI.

BY H. K. MORRISON, CAMBRIDGE, MASS.

Mr. Fred. Tepper has just sent me for examination a very interesting pair of insects taken on the sea shore of Long Island, which approach so nearly the type of *O. chandleri* in my collection from the mountains of Colorado, that I cannot separate them specifically, although there are certain differences, which I give below. The capture is the more valuable since the species of *Oncocnemis*, so far as known, inhabit only the mountains of Europe, Siberia, Colorado and California.

I propose the name *riparia* for this form, and in case the study of larger series of specimens should show it to be a good species, that name can be retained for it.

The principal difference between the insects is in the color of the posterior wings; in *chandleri* ♂ they are white with a broad black even border; in *riparia* ♂ they are entirely white, except that the veinlets are stained with black and there is a slight gray shading at the costal angle; this difference is seen still more distinctly beneath, and then on the anterior wings as well. The posterior wings of *riparia* ♀ above have a dark gray-black border, but beneath they are white as in the male.

In the Coloradan species the outer surface of all the tarsi is checked with black and white ; in the Long Island one these markings are almost entirely obsolete. The markings of the anterior wings of the former species are more prominent and better defined, the ordinary spots are not so elongate, and are united by a short, thick neck, and the basal dash is shorter and thicker ; otherwise the markings are much the same.

The female of *riparia* presents a curious structure of the end of the abdomen, perhaps for the purpose of retaining the male ; the end of the abdomen is bare of scales, but near the tip there is a ring of rather long hairs, followed by a ring of stout curved spines ; such a structure is, so far as I know, unique in the Noctuidæ.

I have not been able to observe the female of *chandleri*, so that I do not know whether it is armed in the same way.

DESCRIPTIONS AND NOTES ON THE NOCTUIDÆ.

BY H. K. MORRISON, CAMBRIDGE, MASS.

Agrotis decolor Morr.

Proc. Boston Soc. Nat. Hist., vol. 17, p. 162.

Agrotis campestris Grote.

Can. Ent., Oct., 1875.

Having received many additional specimens of this species, I am able to give below a fuller description than my original one, and to compare it with its two allies, *geniculata* Grote and *tessellata* Harr.

A. decolor can at once be distinguished from *tessellata* by the dark purple ground color, frequently overspread in the median and basal spaces with cinereous, and by the absence of any gray tint ; from *geniculata* the best character which I have observed to separate it is the color of the thorax, which in *decolor* is brown, having usually the prothoracic and metathoracic tufts yellow, and having always a yellow spot at the base of the tegulæ ; in the former the thorax is simply cinereous and black.

The following are its characters drawn from a large series of specimens from Maine, Canada, New Hampshire, New York and Massachusetts :

Tibiæ spinose. Collar with a lobate central black line. Thorax usually brown, lighter than the wings, having frequently an anterior furrowed tuft and always a posterior tuft. Abdomen smooth, rounded, with the ovipositor of the female slightly exserted. Color of the anterior wings very variable, usually brown with a distinct purple tinge, occasionally the basal and median spaces are suffused with cinereous, and then the subterminal and terminal are dark and contrasting; in other specimens the wings are entirely purple black, in others purple brown, in still others the median space is dark purple brown and the basal and subterminal space bright even yellowish brown; this seems to be the most common form. The ordinary lines are distinct, black and geminate; the usual spots are shaped as in *tessellata*, the space between them is usually filled with black; a black line at the base of the fringe.

Posterior wings whitish or light gray, with a broad, black, marginal band; in the males this band is even and well defined; in the females usually suffuse.

Expanse 30–37 m. m.

I regard this as a northern mountainous species, belonging to the Canadian fauna.

Caradrina meralis, *nov. sp.*

Expanse 31 m. m. Length of body 13 m. m.

This is a comparatively stout, inconspicuously marked species, differing materially from *meskei*, *miranda* and *tarda*, the other species of the genus. Eyes naked. Tibiæ unarmed. Palpi black, tipped with white. Antennæ of the male pubescent. Front, vertex, collar and thorax gray. Abdomen untufted. Anterior wings grayish white; the markings black and quite faint; traces of the half-line; the interior line faint, oblique; exterior line rounded, obsoletely dentate; orbicular spot reduced to a black dot, the reniform forming a conspicuous luniform black mark; subterminal line absent; a partially obsolete series of black dots at the base of the fringes.

Posterior wings white, immaculate, except that the discal dot shows through from below.

Beneath gray, the anterior wings suffused with black, strong discal dots and a common median line, best marked on the costa.

Hab. Maine. Collection H. K. Morrison.

Hadena fibulata Morr.

Bull. Buff. S. N. S., 1874.

I have specimens of this species from Maine and Canada, which offer considerable variation; it is probable that it should be referred to *Hadena* rather than *Dryobota;* it seems to be in a measure intermediate between the two genera.

Hadena norna, nov. sp.

Expanse 23 m. m. Length of body 15 m. m.

This is one of the small, slender species of *Hadena*, belonging to the little sub-genus *Oligia*, as defined by Mr. Grote.

Eyes naked. Antennæ simple. Thorax and abdomen smooth and untufted. Anterior wings light brown, shaded with darker brown in the basal, terminal and central portion of the median spaces; sub-basal space light; interior line simple, fine and distinct, forming three prominent lobes; orbicular spot absent; reniform present, situated in the centre of the median dark space, white and strongly contrasting; exterior line also simple and distinct, incepted on the costa before the reniform; a distinct costal shade before the inconspicuous subterminal line; a black line at the base of the fringe. Posterior wings yellowish gray, with a fine median line. Beneath the anterior wings are blackish, except along the costa and inner margin; the posterior wings are yellowish, both with a median line and the latter with a terminal shade. *Hab.* Maine. Coll. H. K. Morrison.

Easily separated from its allies by the conspicuous white reniform spot.

GRAPTA SATYRUS (Edwards).

BY C. W. PEARSON, MONTREAL, QUE.

On Dominion Day, while at Chateauguay Basin, I collected a number of larvæ which were found feeding on nettle. I secured them in my larva box, and took a quantity of the food-plant with me. When I reached home in the evening I was too busy to examine them carefully, and the next day I found that quite a lot of them had changed to chrysalids.

Among those that had not changed were a couple of *P. atalanta*, and the rest were all *V. Milberti*, a great many of which were infested with parasites, and in a few days all that escaped these foes had changed. In about ten or twelve days they began to emerge, and on opening the box on the 13th, I was much surprised to find one specimen of this beautiful *Grapta* hanging from the empty case. I did not know what it was until I compared it with an example from California. On the 15th also, along with several specimens of *Milberti*, I found another in the box, and comparing both of them with my example from California, I cannot find any difference except that they are in better order. Chateauguay Basin is about fifteen miles south of here, and has never been visited much by collectors, but we have recorded from that locality three insects which have never been taken here (Montreal), viz., *A. bellona* and *E. columbina*, taken by Mr. Jack, and *G. satyrus*, taken by myself.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The fifth annual meeting of the above society was held, according to announcement, in the Court House, in the City of Ottawa, Ontario, on the 22nd day of September, 1875, at 3 p. m. The reports of the officers were read, and a copy of the President's address promised to be placed at the disposal of the printing committee for publication.

The following officers for the ensuing year were then elected :

President—W. Saunders, London ; *Vice-President*—Rev'd C. J. S. Bethune, M. A., Port Hope ; *Secretary-Treasurer*—J. H. McMechan, London. *Council*—Wm. Couper, Montreal ; R. V. Rogers, Kingston ; J. Pettit, Grimsby ; J. M. Denton and E. Baynes Reed, London. *Editor of Entomologist*—W. Saunders. *Editing Committee*—Rev'd C. J. S. Bethune, M. A.; G. J. Bowles, Montreal ; E. Baynes Reed. *Library Committee*—W. Saunders, E. Baynes Reed and J. H. McMechan. *Committee on Centennial Exhibition*—W. Saunders, Rev'd C. J. S. Bethune, M. A., J. H. McMechan. *Auditors*—G. Geddes, Chas. Chapman, London.

The various reports of the officers and from the Branches of the Society will be found in the forthcoming Annual Report.

THE USEFULNESS OF SPIDERS.

BY JOHN G. JACK, HILLSIDE, CHATEAUGUAY BASIN, Q.

I have often wondered why people have such a dislike for spiders, and why, instead of killing, they are not placed upon trees and plants, for they are exceedingly fond of a great many insects injurious to vegetation. I have seen them very busy devouring the interior of a chrysalis of Clisiocampa, and in winter, when out of doors, they generally hybernate under the loose bark of trees, in which case all the beetles and chrysalids in the vicinity are sure to be found destroyed, only the shells remaining. I notice that the Lady-birds (Coccinella) hybernate beside them in safety, and are never destroyed, living even within their webs. Whether this is a natural taste of the spider or an instinct I can only leave for Entomologists to determine ; the fact however remains.

It is well to encourage any insect that can destroy the Clisiocampa, which is likely to cause great mischief the coming season if not destroyed in the rings. In our orchard of 1000 trees, my brothers and I have, after school hours, gathered by actual count about 8000 rings, and still can take off two or three hundred in an hour's time. We are paid a cent per dozen by father, and think it a good thing. The youngest boy is only five years old, and he has frequently gathered 60 or 70 rings after school, even in the short winter afternoons. "Eternal vigilance is the price of" —apples.

MISCELLANEOUS.

Correction and Errata.—The following was received from Mr. W. H. Edwards too late for insertion in our last number: "After the mss. of my paper was sent to the printer, I discovered that I had overlooked the fact that *myrina* is expressly enumerated by Hübner under his coitus *Argynnis*. Also, in reference to the same paper, the following errata: Page 193, lines 14 and 17, for 'class' read 'clan.'"

Pterophorus periscelidactylus.—On the morning of the 31st October, while the thermometer was several degrees below freezing, I captured a healthy specimen of this species. Was not that very late for it?—R. VASHAN ROGERS.

Mr. J. M. Grant, of Crowelton, Buffalo, W. Nebraska, desires to arrange some exchanges with Entomologists in Ontario or Quebec. Parties desiring to exchange will please write him.

Mr. T. G. Schanpp, 25 Broadway, Brooklyn, E. D., N. Y., has many duplicates in Coleoptera from New York, Texas, Louisiana, Florida, &c., which he desires to exchange for specimens from the north ; collects only in Cicindelidæ and Carabidæ.

Mr. W. V. Andrews, 36 Boerum Place, Brooklyn, N. Y., has a number of European, Australian and New Zealand Coleoptera, which he wishes to exchange for species purely Canadian or Arctic.

Mr. George P. Cooper, of Topeka, Kansas, has a large number of Western insects, which he would be glad to exchange for Canadian insects

BOOK NOTICES.

Remarks on Canker Worms and Description of a New Genus of Phalaenidæ, by Chas. V. Riley, 8vo., 8 pp., with eight wood-cuts. Through the kindness of the author we have been supplied with an advanced copy of the above paper, in which the many points of difference between *vernata* and *pometaria* are clearly pointed out ; the differences in structure being sufficiently great to require, in the author's opinion, the erèction of a new genus for *vernata.*

The Lepidopterist's Calendar, by Joseph Merrin, second edition, price 3s. 6d., published by H. Marsden, Gloucester, England. This is an excellent little work of 250 pages, giving the time when the various species of British Lepidoptera appear in the egg, larval, pupal and imago states, with the food plant and habitat, all thoroughly worked up to the present time. Mr. Marsden has appointed Mr. W. V. Andrews, 36 Boerum Place, Brooklyn, N. Y., as his American agent for the sale of this work.

Bulletin of the Buffalo Society of Natural Sciences, Vol. iii. No. 1. Contains Description of a New Crustacean, already referred to in our

August No.; a paper on Texan Lepidoptera, by Dr. Leon F. Harvey; on New species of Eusarcus and Pterygotus, by A. R. Grote and W. H. Pitt, and Part II of Synopsis of Fungi of the United States, by M. C. Cooke, M. A.

The Structure and Transformations of *Eumaeus atala*, by Samuel H. Scudder. 4to, 8 pp., with one excellent lithographic plate, from the Memoirs Bost. Soc. Nat. Hist. Notice of the Butterflies and Orthoptera collected by Geo. M. Dawson, as Naturalist of the B. N. A. Boundary Commission, 8vo, pp. 5, by Samuel H. Scudder. We tender the author our sincere thanks for copies of the above valuable papers.

The Scientific Monthly—a magazine devoted to the Natural Sciences; E. H. Fitch, Editor and Proprietor, Toledo, Ohio, Vol. 1, No. 1. This new claimant for public favor is an 8vo journal of 48 pages (the first number, owing to an accident, is only 40 pages). It contains several papers of interest to the Naturalist, among which we would especially mention "First Impressions of the Bird Fauna of California, by Prof. Robert Ridgeway." The subscription price is $3 a year in advance, or 45 cts. a number.

The Cincinnatti Quarterly Journal of Science, Vol. II, No. 4, October. 1875. The October number of this valuable quarterly contains two papers on Entomology, one on the Tineina of Colorado, by our esteemed friend and contributor, V. T. Chambers, of Covington, Kentucky; the other on Lepidopterous Larvae, by A. G. Weatherby. Mr Chambers is at present residing in Colorado, and his paper gives the results of personal observations on the Tineina of Colorado, many of which have been taken at altitudes of from 7,000 to 11,500 feet. In it he gives descriptions of twenty-two new species, besides references to others already described. These were all captured or bred from July 20th to Sept. 1st. Among others, Mr. Chambers has taken in this far distant locality *Œcophora borealella*, first described from specimens sent to him from London, Ont., by the Editor of this journal, and *Argyresthia goedartella*, hitherto known in this country only from specimens captured at Quebec by M. Belanger, thus proving a very wide range for these tiny creatures.

CANADIAN ENTOMOLOGIST.—Having had several of the earlier numbers of our journal reprinted, including index for Vol. I, we are now prepared to furnish full sets of our ENTOMOLOGIST, or any back numbers required.

The Canadian Entomologist.

VOL. VII. LONDON, ONT., DECEMBER, 1875. No. 12

LEPIDOPTEROLOGICAL OBSERVATIONS.

BY A. R. GROTE, A. M., BUFFALO, N. Y.

Director of the Museum, Buffalo Society Natural Sciences.

Nola ovilla, n. s.

♂. A small frail form with ciliate antennæ, no ocelli, and long, dependent palpi, their second joint thickly squamous. Fore wings grayish white, with the inner line black, fine, angulated. Outer line denticulate, followed by a pure white shade. A pure white shade in the place of the subterminal. Hind wings dusty white. Beneath the fore wings are pale fuscous, immaculate; hind wings whitish with a discal dot. Expanse 16 m. m. Canada, Mr. Saunders. This species differs decidedly from the N. Am. species described by Prof. Zeller; I do not find descriptions of N. Am. species in any other author.

Dilophonota merianæ Grote.

According to my correspondent, Mr. Meske, this species, formerly known from Cuba and Mexico, has been found in Texas by a collector and examples reared from larvæ. It must therefore be included in the List of our Sphingidæ.

Apatela tritona (Hübn.) Zutr., 107, 108.

Hübner's figure has the t. p. line more irregular and the hind wings more yellowish than the form we consider as intended. *A. grisea*, differs by the white hind wings, and is, *perhaps*, redescribed as *pudorata* by Mr. Morrison in the Annals of the N. Y. Lyceum. No comparison with *grisea* is made of his new species by Mr. Morrison. Specimens of *tritona* show the stigmata, and the inner edge of the reniform is perhaps included with the median shade in Hübner's figure. It is on a line with it in the specimens, which have also the small orbicular very faintly outlined and which latter may be indicated by the two dots in Hübner's figure. On the whole, I cannot see that Guenée's description of *tritona* differs from

my material, and it is not clear that Mr. Morrison has identified a species more nearly resembling Hübner's figure than the ordinary identification of *tritona*.

Apatela grisea (Walk).

I have examined Mr. Walker's types in the British Museum, and I made the note: Fore wings like *tritona;* hind wings white. Professor Bélanger sent me a species which I considered to be this of Walker's. It now appears to me that Mr. Morrison has altered my determination and described the moth as a new species. I think that, until Mr. Walker's species is more satisfactorily identified, my own determination should not be interfered with.

I have since identified several of the species marked unknown to me in the "List" of 1874. A shorter compilation of the "List" is now published. It is no proof that the species is unknown now, that it was at that time. For instance, I have since identified *Schinia gracilenta*, and it seems to me that it is the same as *oleagina* Morr.; in my specimen the subterminal space is a little darker than terminal, as somewhat exaggeratedly shown in Hübner's figure; there is a faint discal discoloration beneath and traces of a subterminal line; the hind wings above are hardly "rosy" along exterior border. My specimen is undoubtedly the same species as Mr. Morrison's, and also came from my old school-friend Mr. Graef. I come to the conclusion that *oleagina* is not a var., but a synonym of *gracilenta*.

Apatela dentata, n. s.

♂. This is allied to *tritona* and *grisea*, but is a smaller species wanting all the black dashes. The ground color is blackish, shaded over with whitish. The lines black, single, denticulate. The claviform is indicated by a slight black mark. Orbicular obsolete. Reniform whitish, rounded, with its outward edge black-lined and shaded. T. a. line running in a little on median vein. T. p. line inaugurated above the reniform, running well outwardly, denticulate throughout its length. Subterminal line hardly apparent; a blackish shade over median nervules on the gray terminal space. Fringes gray preceded by blackish interspaceal markings. Hind wings fuscous, lighter towards the base, with indistinct line. Beneath much paler, irrorate, without discal marks and with a common shaded line.

Expanse 32 m. m. Quebec, Mr. Bowles.

Mamestra Goodelli, n. s.

♀. Resembles at first sight *Hadena misclioides*, but the eyes are hairy, size smaller, and color more brownish. Fore wings shiny reddish brown, with the terminal space and costal region shaded with greenish. Collar greenish, edged with black. Thorax reddish with the tegulae dark margined. Transverse lines geminate, rather indistinct, slightly lunulate; t. p. improminently exserted. Orbicular small; reniform moderate, ill-defined, outwardly shaded with whitish. Subterminal line improminent; no W-mark. Hind wings fuscous with pale fringes; beneath with terminal space of primaries pale. A double exterior shading and discal point on secondaries; primaries fuscous, with the commencement of an angulated exterior line indicated on costal region and obscure discal point. Above the pale pre-apical costal points are noticeable. *Expanse* 30 m. m. Amherst, Mass.; from Mr. L. W. Goodell, after whom I name the species, and numbered 291.

The greenish or olive tintings of this species are difficult to localize and are very slight.

Dianthoecia lustralis, n. s.

♀. Resembles *Mamestra legitima;* allied to *Dianthoecia pensilis.* Lilac gray, the median space shaded with light reddish below median vein and about reniform. Median shade blackish, diffuse. Lines improminent, geminate, the pale included spaces noticeable; t. a. line outwardly exserted, narrowing the median space. Claviform marked by a short black oblique dash. Orbicular small, pale, distinct, rounded. Reniform narrow, pale, with an interior annulus. S. t. line below vein 6 preceded by a carneous shading, and followed by dark scales; inflected below vein 2. Fringes dark, obscurely cut with pale. Hind wings dark fuscous with paler fringes; the median line from beneath reflected. Under surface of hind wings paler than above, showing dot and line; fore wings fuscous with paler terminal space. Collar with a black line. Expanse 30 m. m. Racine (O. Meske).

Anarta promulsa.

Mamestra promulsa Morr., Ann. N. Y. Lyc., 1875, 97.

♀. This is rather a large species for the genus, but its characters are those of *Anarta*, and it is allied to *Anarta nivearia* Grote. A good example is in the collection of the Buffalo Society of Natural Sciences,

received from Mr. Theo. L. Mead and ticketed "20, Colorado." The eyes are hairy; thorax and head shaggily haired without mixture of scales; head improminent; abdomen without tufts; size a little larger than *Anarta subfuscula* Grote, from the same locality, with which species it agrees in the shape of the wings; the tongue is stout. I suppose the hairy eyes induced the reference to *Mamestra*, this, with the other characters, agreeing in reality with *Anarta*.

Lygranthoecia Meskeana, n. s.

Fore wings smooth with the terminal space olive green, the median space light purple and the basal brownish. Median lines geminate with white included spaces; the t. a line straight to median vein, below which it is slightly outwardly rounded; t. p. line sinuate, becoming medially indicated by white dots. Fringes olivaceous. Hind wings black with a band of three light yellow spots; a pale interruption medially along terminal margin; fringes yellowish. Thorax and head olive; abdomen yellow. Legs marked with reddish. Beneath pale yellow, fore wings with a sub-basal triangulate patch, a discal spot and subterminal band black; above the spot and band are vinous costal shades. Hind wings with black discal spot and black subterminal band extended along internal margin and basally within the spot; costal region vinous. *Expanse* 24 m. m. Bastrop Co., Texas, from Mr. O. Meske, to whom I dedicate the beautiful species.

Heliothis lupatus, n. s.

♀. Fore tibiæ with a longer inner and shorter outer terminal claw. Habit of *phlogophagus*. The entire insect is ochreous, stained with a reddish tint. Fore wings with the t. p. line guttate, black points, touched with white; t. a line dentate. Reniform black with white centre; orbicular small, blackish; median shade deeper colored than the wing; the wing deepens outwardly in tone or becomes more orange. The narrow subterminal space is darker. A terminal series of black dots alternated with orange. Fringes plumbeous, contrasting. Hind wings like fore wings, with pale fringes, a small faint discal mark and fine central line; similar beneath, where the fore wings show a large exterior and small interior black discal spot and an indication of an exterior black shade line. *Expanse* 28 m. m. Bastrop Co., Texas, Mr. Meske.

Tarache binocula, n. s.

Allied to *cretata*. Fore wings yellowish white with a perpendicular

median yellow stripe which margins, below the median vein, outwardly, a broad subterminal plumbeous black band, running obliquely to costa before the apex and edged outwardly with a yellowish stain. Terminal space cut by a blackish line. In one specimen the plumbeous band is obsolete and there is nothing on the yellowish white primaries but the perpendicular yellow median stripe, narrowly edged with blackish below median vein, the rounded discal blackish reniform (which in the type is included in the plumbeous color and faintly edged with white) and some yellow apical shadings. Fringes white. Hind wings silvery white with fuscous terminal shade widening at apices. Beneath fore wings fuscous, whitish along costa and internal margin; hind wings white with the costa sometimes a little touched with fuscous and external margin obsoletely lined. Expanse 21 m. m. Texas, Mr. Belfrage, No. 112. Bastrop Co., Mr. Meske.

It has perhaps been confounded with *cretata*. *Cretata* is milk white; *binocula* yellow white, and the coloration of fore wings beneath gives distinguishing characters. The rounded reniform is a noticeable character and allies the moth to *candefacta*, than which it is a stouter species.

Spragueia guttata, n. s.

Allied to *dama* and *leo*, but strongly differing in the detail of the markings. The fringes are orange, touched with black at internal angle opposite the cell (as in *dama*) and at apices. The wing is broken up into sulphur yellow spots by the black lines and ground color. An orange median fascia extends upwardly to the disc before the yellow, black-circled, round reniform, and extends to apices beyond the spot. Internal margin touched with orange at base. Collar and tegulae orange; disc of the thorax yellow, marked out by black inner lines to the patagia and with two plumbeous spots. Hind wings blackish; abdomen zoned with pale yellow, beneath whitish with orange tip. Beneath the wings are blackish with faint lines; on primaries the orange fringes are marked with black as on upper surface. *Expanse* 16 m. m. Bastrop Co., Texas, Mr. Meske.

Spragueia fasciatella, n. s.

Allied to *tortricina* Zeller, and similarly sized, differing by the dull ochreous or paler color of the narrow fore wings, which have black fringes, and by the t. p. line being visible and preceded by a shade of a deeper tint than the ground color; the s. t. line is also preceded by a

similar shade band. Black dots mark the stigmata; the rounded t. a. line is also followed by a darker shade. Variable in tone and distinctness of the three shade bands. Hind wings and under surface much as in *tortricina*. Texas, Belfrage, Nos. 125 and 126, July 6, 8.

Agrotis turris Grote.

Under this name, which I communicated to Mr. Norman before his leaving for Europe, I drew up the description from Canadian specimens (sent me by Mr. Norman), which has since been published under the determination "Cinereomacula Morr.," in the Proc. of the Phil. Acad. of N. Sciences. I made this alteration in the proofs because Mr. Morrison sent me a specimen of *turris* as his "cinereomacula," previously imperfectly described by him in the Boston Proceedings. Upon Mr. Morrison's request I sent him my specimens. On their return I am surprised to find that he declares his "cinereomacula" to be something different, and returns me my own specimens as *his* types under a *new* ms. name of *his*, thus suppressing my own prior designation for the species which I had previously communicated to him and had only abandoned in consequence of his own determination. The species will be known under the above name of *turris*.

Agrotis mimallonis Grote.

I have, through the kindness of my correspondents, been very recently able to compare my types of this species and *rufipennis* Grote. The names are synonymous, the latter name having been founded on a specimen with obliterate ornamentation. Both specimens are from New York, and I had returned Mr. Mead's type long previously to receiving Mr. Lintner's.

EXPLANATION OF PLATE.

The specimens illustrated on the accompanying Photographic Plate were taken at St. Catherines or Orillia by Mr. George Norman, of Cluny Hill, Forres, Scotland, and are interesting since they are mostly types of new species described in these pages. Their discovery is due to the scientific enthusiasm of Mr. Norman, who has spent two years in Canada to the benefit of Entomological knowledge and the pleasure of his North American friends.

The following is the explanation of Plate 1:

1. Parastichtis gentilis *(Grote)*. Male type.

2. Parastichtis perbellis *(Grote).* Female type.

A second specimen has been since received from London (Mr. Saunders).

3. Parastichtis minuscula *(Morr.).* Female. Orillia, Mr. Norman.
4. Litholomia napaea *(Morr.).* Orillia.
5. Agrotis friabilis *Grote.* Type.
6. Agrotis campestris *Grote.* Type.

I am informed by Mr. Morrison that this is *Agrotis decolor*, Proc. Bost. S. N. H., 1874, 162. This was not readily perceivable from the remarks of Mr. Morrison, who compared his species with *geniculata* G. & R., whereas *campestris* is very close to *tessellata.* A specimen sent to Mr. Morrison after the Boston paper appeared was returned to me as a "var. of *tessellata*"; and without nearer determination, I accordingly described it, not agreeing with this determination, and am surprised to find it now stated to be "*decolor.*"

7. Agrotis (Matuta) Catherina *Grote.* Female type.
8. Agrotis (Pachnobia) Orilliana *Grote.* Female type.

This I am informed is *A. claviformis* l. c. This species belongs to Guenee's genus *Pachnobia.* Its short description in the Boston Proc. was additionally unintelligible, since "*claviformis*" is there compared to *sigmoides*, which latter belongs to a different group.

9. Agrotis versipellis *Grote.* Male type.
10. Apatela subochrea *Grote.* Type.

Allied to the European *salicis.*

11. Oligia versicolor *Grote.* Type.
12. Agrotis badicollis *(Grote).* Male. Orillia.
13. Crocigrapha Normani *Grote.* Type.
14. Agrotis rubifera *Grote.* Type.

I formerly incorrectly determined this last species as the same with the European *rubi.* Dr. Speyer has kindly compared it and finds our species different.

AN ABSTRACT OF DR. AUG. WEISMANN'S PAPER ON "THE SEASONAL-DIMORPHISM OF BUTTERFLIES."

[LEIPZIG, 1875, PUBLISHED BY W. ENGELMANN.]

To which is Appended a Statement of Some Experiments made upon Papilio Ajax.

BY W. H. EDWARDS, COALBURGH, W. VA.

Dr. Weismann has lately published an account of certain experiments made by him during a course of years with a view to determine the facts relating to seasonal-dimorphism, and from them to deduce the reasons for the phenomena. As several North American butterflies are thus dimorphic, I have thought that the substance of Dr. Weismann's paper would be interesting to the readers of the ENTOMOLOGIST, it being too long to print in full. I have therefore written out the following abstract, following as closely as possible the language of the author. I have added a statement of my own experiments with *Papilio ajax*, the results of which confirm the theory advanced by Dr. Weismann as to the causes of the phenomena in question.

The phenomena of seasonal-dimorphism had been known for a long time, and had been established in the case of *Vanessa prorsa* and *levana* early in this century, *prorsa* being the summer, *levana* the winter form. Prof. Zeller ascertained that *Lycaena amyntula* and *L. polysperchon* were summer and winter forms of one species. Dr. Staudinger found *Anthocharis belia* and *ausonia* to have the same relationship. On his interest being excited by these cases, the author instituted experiments. At first he supposed that the difference in the butterflies might be of a secondary nature, having its foundation in the difference of the larvæ, which might be owing to the difference in the food plants of the winter and summer broods. But the most strongly dimorphic butterfly, *levana*, feeds on one plant only, *Urtica major*, and although the larvae show a pronounced dimorphism, the two forms do not alternate with each other, but make their appearance in every generation. He then experimented on the indirect influence of the seasons, but concluded that the cause of the phenomena did not lie here. It must then lie in the direct influence of changing outward conditions of life, those in the winter generation being undoubtedly different from those of the summer generation. There are

two factors from which such an influence might be expected, temperature and length of development, i. e., the duration of the pupa period. The duration of the larva period may be neglected, as this is very little shorter with the winter generation (at least with the species used for experiment). Starting at this point, experiments were made with *levana*. From the eggs of the winter generation, which had emerged as butterflies in April, the author bred larvae, which, immediately after they turned to chrysalids, were put into an ice box, in which the temperature was but 8° to 10° R. (52° Fahr.) It appeared that this temperature was not low enough to have much effect, for when after 34 days the box was taken out of the ice chest, all the butterflies (about 40) had emerged. The experiment succeeded in so far that instead of the *prorsa* form to be expected under ordinary circumstances, most of the butterflies emerged as the so-called *porima*, i. e., as one of the intermediate forms between *prorsa* and *levana*, sometimes taken out of doors, and which more or less resembles *prorsa* in design, but has much yellow like *levana*. In the succeeding experiment the author placed the pupae directly in the ice house, where the temperature was 0 to 1, R. (33° Fahr.), and left them there four weeks. Of twenty butterflies fifteen emerged *porima*, and among these were three which looked exactly like *levana*, except that the narrow blue border line was wanting. Five butterflies of the lot were unchanged, but came out *prorsa*, and therefore were uninfluenced by the cold. From this it appeared that by four weeks of cold down to 0-1 R., a greater part of the butterflies inclined toward the *levana* form, and single individuals arrived at the same almost completely. Should it now not be possible to make the change complete, so that every one should have the *levana* form? But the author never succeeded in bringing this about. There were always some individuals which kept the summer form, others were intermediate, and but a few so changed that they looked like genuine *levanas*.

Experiments succeeded better with some of the Pierides, many of which show the phenomena of seasonal-dimorphism. In *P. napi* the summer and winter forms differ strikingly. Numerous individuals of the summer generation were set in the ice house immediately after becoming chrysalids, the cold being 0-1 R., and were left for three months, then brought (11th Sept.) into the green-house. Between 26th Sept. and 3rd Oct. there emerged 60 butterflies, which, without an exception, bore the characters of the winter form, most even in an uncommonly strong degree. But all did not emerge in the green-house, a part going over the winter, and emerging the winter form the next spring.

The author repeatedly tried the experiment of changing the winter to the summer form by the application of heat, but always failed, and concludes that *it is not possible to constrain the winter generation to embrace the summer form.* He then goes on to state that *levana* has not only two generations in a year, but three, and is polygoneutic (coining a word to indicate the fact whether a species has one, two or more generations: mono-di-poly-goneutic, from goneuo, to produce). A winter generation alternates with two summer generations, and the last of these gives as the fourth generation of the year hybernating pupæ, which in the next April emerge as the first generation, and in the *levana* form. Such pupæ (of the fourth gen.) he many times, immediately on their reaching that stage, placed in the green-house. But the result was always the same; nearly all the pupae hybernated. In one instance only did a *porima* appear among them, all the rest being *levana.* But some of the butterflies emerged in the autumn, after 14 days in pupa. These were always *prorsa* except in one instance of *porima.* From these experiments it appeared that like causes (warmth) have different effects on the different generations of *levana.* With both the summer generations the high temperature induced always the *prorsa* form; with the third this happened but seldom and with single individuals, while the great mass kept the *levana* form unchanged. One might say that this has its foundation in the fact that the third generation has no inclination to hasten its emerging under the influence of warmth, but that by a longer duration of the pupa state must always come out the *levana* form. The cause of different behavior under like influences can lie only in the constitution, the physical nature, of the generation concerned, and not in outside influences. It distinctly appears that cold and warmth cannot be the immediate cause why a pupa emerges *prorsa* or *levana.* The explanation of the facts is given as follows: The *levana* form is the primary original type of the species. The *prorsa* form the secondary, produced by the gradual influence of the summer climate. Where we are able by cold to change individuals of the summer generation into the winter form, this rests upon a reversion to the original form, upon atavism, which, as it appears, is most readily called out by cold, that is, *by means of the same outside influences to which the original form was exposed through a long period of time,* and whose continuance has preserved to this day, to the winter generation, the primitive marking and color. The arising of the *prorsa* form the author imagines to have occurred as follows: it is certain that a so-called ice period existed during the diluvial period in Europe. This

may have spread a true polar climate over our temperate zone, or perhaps a lesser degree of cold may have prevailed, with increased deposition of rain and snow. At all events, the summer was then short and comparatively cool, and the existing butterflies could only produce one generation in a year. They were all monogoneutic ; *levana* had but the form of *levana*. When the climate gradually became warmer, a period must have come on in which the summer lasted so long that a second generation could be interpolated. The pupae of the *levana* brood, which had hitherto slept through the long winter, could now during the same summer in which they had hatched as larvae fly as butterflies. Only the brood which proceeded from these last hybernated. There had come to be a state of things in which the first generation grew up under very different climatic influences from the second. So considerable a change as now exists between the *prorsa* and *levana* forms could not have taken place suddenly, but must have done so by degrees. If it did arise suddenly, this would signify that every individual of this species possessed the power to take two different shapes according as it was subjected to warmth or cold. But the experiments have shown that this is not so, that rather the last generation has an ineradicable tendency to take the *levana* form which protracted heat will not alter, while both summer generations have a preponderating tendency towards the *prorsa* form, although they allow themselves frequently to assume the *levana* form in various degrees by lengthened influence of cold.

It seems to the author that the quoted result of his experiments may not only easily be explained by the supposition of a gradual climatic influence, but that this supposition is upon the whole the only admissible one. While by the changes from the ice period to that of our present climate, *levana* altered gradually from a monogoneutic to a digoneutic species, at the same time a sharper dimorphism stamped itself gradually upon it, which only arose through the changing of the summer generation, while the winter generation held fast to the primary shape and marking of the species. When the summer became still longer, a third generation could be interpolated, and the species became polygoneutic, and in this manner, that two summer generations alternated with one winter generation.

The theory explains why at the same time the summer generation was allowed to change, but not the winter one. The last cannot possibly return to the *prorsa* form, because this is much younger than itself. But

when among a hundred cases one appears where a pupa of the winter generation, induced by warmth, completes its change (to *prorsa*) before winter, this is inexplicable. It cannot be atavism which here compels it in the direction of the emergence; but we see from it that the changes in the first two generations have already called forth a certain change in the third, which discovers itself in this, that under favorable circumstances single individuals assume the *prorsa* form. Or, as might also be said, the alternating transmission, which carries with itself the ability to take the *prorsa* form, as a rule remains latent in the winter generation, then with single individuals turns to a continuous transmission. It is true we have as yet no kind of insight into the nature of the process of inheritance, and therein the incompleteness of this explanation is marked, but we still know many of its outward forms of phenomena. We know that one of these forms consists in this, that peculiarities in the father will appear again not in the son, but in the grandson, or even further on; that, too, they may be transmitted latent. Let us suppose a peculiarity should be so transmitted that it always appeared in the first, third and fifth genera tions, and remained latent in the intervening ones. It would not be incredible that the peculiarity should exceptionally, that is, from a cause unknown to us, appear in single individuals of the second or fourth generations. But this agrees with the cases mentioned in which exceptionally single individuals of the winter generation took the *prorsa* form, only with the difference that here a cause—heat—appeared which occasioned the bringing out the latent characters; though in what way it exerts this influence we are unable to say. These exceptions to the rule are no objection to the theory. On the contrary, they give us a hint that where one *prorsa* generation had formed itself, the gradual insertion of a second might be facilitated by the existence of the first. It is not to be doubted that in the open air single individuals of the *prorsa* form sometimes emerge in September or October. But if our summer were lengthened by a month or two, these could lay the foundation of a third summer generation, just as a second is now an accomplished fact.

Dorfmeister (who formerly experimented on the effect of cold on pupae of butterflies) believes that he may conclude that temperature exerts the greatest influence during the turning into chrysalis, but nearly as much shortly after the same period; and this conclusion may be correct in so far as everything depends on whether in the beginning the formative processes in the pupa turned in this or that direction, the final result of which is the *prorsa* or *levana* type. When, however, one or the other

direction has been taken, it may through the influence of temperature be accelerated or retarded, but cannot be any more changed. It is very possible that a period may be fixed at which warmth or cold might be able to divert the original tendency most easily, and it may exist in the first days of the pupa state.

If it be asked why in the analogous experiments with *napi* the reverting was always complete, we may suppose that with this species the summer form has not been so long in existence, and therefore will be more easily abandoned ; or that the difference between the two generations has not become so distinct, which, moreover, indicates that here again the summer form is of younger origin. Or, finally, that the inclination to revert may be quite as great with different species as with different individuals of the same species. But at all events, the facts are confirmed, that all individuals will be moved by cold to a complete reversion. The opinion is expressed in reference to *prorsa*, that in these experiments it does not depend so particularly on what moment of the development the cold is applied, and that differences in the constitution of individuals are much more the cause why the cold brings these pupæ to a complete reversion and those to but a partial one, and has no influence whatever on others. Especially interesting in this relation is the American *Papilio ajax*. This butterfly, similar to the European *podalirius*, appears wherever it is found in three varieties, which are designated as var. *telamonides*, var. *Walshii*, and var. *marcellus*. Edwards has proved by experiments, breeding from the egg, that all three forms belong to the same cycle of development ; of such nature, that the first two appear only in spring and always come only from over-wintering pupae, while the last form, var. *marcellus*, only appears in summer and that in three generations successively. There appears here a seasonal-dimorphism allied to common dimorphism. Winter and summer forms alternate with each other, but the first appears again in two forms, or varieties, *telamonides* and *Walshii*. Omitting for the present this complication, and looking at these winter forms as one, we have four generations, of which the first possesses the winter form ; the three following, on the contrary, the summer form, *marcellus*. The peculiarity of the species lies in this, that with all these summer generations only a part of the pupae emerge after a short time (14 days), but another portion remain the whole summer and the following winter in the pupa sleep, in order to emerge only in the spring, and then always in the winter form. For example, of fifty pupae of the second generation which had formed

chrysalids at the end of June, after fourteen days, forty-five *marcellus* emerged, but five remained over till the next spring and then emerged *telamonides*. The explanation of this fact follows very simply from the above stated theory. According to this the two winter forms must be considered as the primary, but the *marcellus* form as the secondary. But the last is not yet so firmly established as with *prorsa*, where a reverting of the summer generation to the *levana* form is only accomplished through special outside influences; while here there are in every generation single individuals with which the inclination towards reversion is still so strong that the extremest heat of summer is incapable of diverting them from their original hereditary disposition, to accelerate their emerging and to force them to take the *marcellus* form. Here it is indubitable that the old hereditary tendency is not restrained by different outside influences, but wholly by internal causes, for all the larvae and pupae of many different broods were simultaneously exposed to the same outside influences. If it be asked what significance belongs to the duplication of the winter form, it may be answered that the species was already dimorphic at the time when it had but one generation a year. Still this explanation may be gainsaid, for such a dimorphism is not elsewhere known, though indeed some species possess a sexual dimorphism in one sex—the female —as in the case of *Papilio turnus*, which has two forms, but not as is here the case, belonging to both sexes. And therefore perhaps another theory must be advanced. With *levana* we saw the reversion occurring in very different degrees with different individuals; only rarely it reached the genuine *levana* form, generally only succeeding in reaching part way, as far as the so-called *porima* form. Now, it would be at all events astonishing if with *Papilio ajax* the reversion were every where complete, as exactly here the inclination to revert is so different in different individuals. It might therefore be presumed that one of the two winter forms, indeed *telamonides*, is nothing else than an incomplete reverting form, answering to *porima* with *V. levana*. Then *Walshii* only would be the original form of the butterfly, and with this would agree the fact that this variety appears later in the spring than *telamonides*.* Experiments ought to be able to give the explanation. The pupae of the first three generations placed upon ice ought to give for the greater part the *telamonides* form, the lesser portion should be *Walshii*, and only a few, perhaps no individuals should emerge *marcellus*. And this may be assumed to be

* There is an error here, *Walshii* being the earlier form.—E.

the result, from the view that the inclination to revert is great, that even with the first summer generation, which were the longest exposed to the summer climate, always a portion of the pupae, without artificial means, emerged *telamonides*, but another portion *marcellus*. This last will now become *telamonides* by the application of cold; the first, on the contrary, will wholly or in part revert to the original form *Walshii*. One would expect that the second and third generations would revert still more easily, and in greater percentage than the first, because these last had first taken the new form *marcellus*, but from the experiments so far made can no other conclusion be drawn. To be sure, of the first summer generation, only seven pupae out of sixty-seven over-wintered and emerged *telamonides;* while of the second generation forty out of seventy-six over-wintered; of the third twenty-nine out of forty-two. But for closer conclusions more extended experiments will be necessary.

After the experiments so far had, one might still incline to the supposition that through seasonal-dimorphism the outside influences working directly upon single individuals would force upon them one or the other form. But this is not tenable. That cold does not bring one and heat the other form follows from this, that with *ajax* each generation produces both forms. Further, the author often reared the last, or over-wintering generation of *levana* in the warmth of a room, and yet always got the winter form. The length of the pupa period does not determine in individual cases the form of the butterfly, or consequently determine whether the winter or summer form shall emerge, but the length of the pupa period is dependent upon the tendency which the growing butterfly has taken in the pupa. As a rule, the two winter generations of *ajax* emerge only after a pupa period lasting from 150 to 270 days, but single cases occur in which the period is no longer than with the summer form (14 days). With *levana*, too, occurs a similar phenomenon, for not only was the winter form forced to a certain degree by artificial warmth during the pupa period, but the summer generation produced many reverting forms without the period having been at all protracted. The half way reverting form *porima* was known long before any one thought of producing it artificially by the influence of cold. It appears in midsummer on the wing occasionally. * * * * If the explanation, then, is correct, the winter form is the primary and the summer form the secondary, and such individuals as embrace either naturally or artificially the winter form are to be considered as examples of atavism. It appears also that the individuals of a species are influenced by climatic change to

a variable extent, so that the new form is made permanent sooner in one species than in another. From this there must follow a variability of the generations concerned, that is, single individuals of the summer generation must differ more widely in markings and coloring than is the case with those of the winter generation. The facts agree with this as regards *levana*, the winter form being much more constant than the summer, and in this *(prorsa)* it is hard to find two individuals exactly alike.

So far I follow the paper. After reading it I wrote Dr. Weismann as to the peculiarity noticed by me that while out of doors, in the early spring, *Walshii* was abundant, and for some weeks the only form of the species to be met, I had scarcely ever been able to obtain it by breeding, all the over-wintering chrysalids, with one or two exceptions, no matter from which generation, producing *telamonides*. In the Supplementary Notes to Butterflies of N. A., I had given the results of ninety-two over-wintering chrysalids from eggs of many broods of the three forms bred in 1871, and not one *Walshii* appeared, while that same spring, 1872, between the 11th and 29th of April, Mr. Mead, at Coalburgh, had taken sixty-three specimens of *Walshii*, and had taken or seen but one *telamonides*. To this Dr. Weismann replies: "The case of *Walshii* and *telamonides* is indeed very singular and not easy to explain. Nevertheless, I should believe that the ordinary warmth of the room in winter is the cause which prevents the chrysalids acquiring the perfect winter form *Walshii*. The case of *ajax* is more complicated than the other cases of seasonal-dimorphism. It seems now to me possible that not the form *Walshii* is the primary, but *telamonides*. It seems *telamonides* results from all generations. This primary form could have been changed by summer heat into *marcellus*, by winter cold into *Walshii*. But this would pre-suppose that *telamonides* has originated in the south and there resided at the time of the great glaciers."

Following the suggestions of Dr. Weismann, I have made experiments the past season on the chrysalids of *ajax*, having bred from eggs laid by var. *telamonides* the last of May many larvæ, from which resulted between 22nd and 26th June, 122 chrysalids. These as fast as formed were placed on ice in the refrigerator, in small tin boxes, and when all were formed were transferred to a cylindrical tin box, four inches in diameter and six high, and packed away in layers between thin partings of fine shavings. (I used shavings because no better substance was at hand, having found cotton liable to mould when exposed to dampness.) The box was set in a small wooden box, and this was put directly on the ice

and so kept till 20th July. I had then to leave home for a few weeks and sent the box to the ice house, with directions to place it on the surface of the ice. I learned afterwards that this was not done, but that it was set on straw near the ice. By this means the influence of the cold was necessarily modified, and I doubt if the chrysalids within the box, from the manner in which I had packed them, were equally subjected to the cold, those on the outside certainly feeling its full effects, but those in the middle to a less degree, and perhaps so much less as not to have made the experiment of much value so far as they were concerned. I returned on the 20th of August and was informed that the ice in the house had just failed. The chrysalids had been subjected to quite a low temperature, and an equable one, while in the refrigerator for between three and four weeks, but from the defective packing had then probably not felt the cold in an equal degree, and they had been subjected to a lesser degree of cold in the ice house for five weeks longer, which also for some time must have been daily diminishing as the volume of ice decreased. That the severity of the cold was not sufficient to prevent the emerging of the butterflies was apparent when I opened the box, for there were discovered a number of dead ones, which had died as soon as they emerged, the wings being quite unexpanded. I threw out twenty-seven such, besides a number of dead chrysalids, and lamented that my experiment had failed, and that the work would have to be done over again next year. But one butterfly was alive, just from its chrysalis, and this I placed in a box in the house in order that it might expand. Here it remained forgotten till late at night, when I discovered that it was a *telamonides of the most pronounced type.* The experiment had not failed then. Early in the morning I made search for the dead and rejected butterflies, and recovered a few. It was not possible to examine them very closely from the wet and decayed condition they were in, but I was able to discover the broad crimson band which lies above the inner angle of the hind wings, and which is usually lined on its anterior side with white, and is characteristic of either *Walshii* or *telamonides*, but is not found in *marcellus*. And the tip only of the tail being white in *Walshii*, while both tip and sides are white in *telamonides*, enabled me to identify the form as between these two. There certainly were no *Walshii*, but there seemed to be a single *marcellus*, and excepting that all were *telamonides*.

The remaining chrysalids were now kept in a light room, and next day three *telamonides* emerged. By the 4th September fourteen of the same

form in all had emerged, but as yet no *marcellus* or intermediate form After that date a few *telamonides* appeared at intervals up to 20th Sept., but a large proportion of the butterflies, namely, twelve out of twenty-six, between the 4th and 15th were intermediate between *telamonides* and *marcellus*, some approaching one, some the other more nearly. On 4th Sept. the first examples wholly *marcellus* appeared, and one followed on each day, the 6th, 8th, 13th and 15th; from the 15th to the 3rd of Oct. six out of ten were *marcellus*, and two intermediate; a single example between *telamonides* and *Walshii* appeared 3rd Sept., in which the tails were white tipped as in *Walshii*, but in size and other characters it was *telamonides*, though the crimson band might have belonged to either form. Up to the 20th Sept. one or more butterflies emerged daily, on one day, the 4th, eleven; after the 20th single individuals appeared at intervals of from four to six days, and the last was on 16th Oct. So that the whole period of emerging after the box was brought from the ice house was 57 days, and it had commenced some time before that occurred. The natural duration of the chrysalis state in such examples of *ajax* as emerge the first season is only about fourteen days, but in very rare instances in my experience single individuals have emerged after a period of from four to six weeks. In all, 50 butterflies emerged between the 20th August and 8th October, divided as follows:

Telamonides	22.
Between Telamonides and Walshii	1.
Between Telamonides and Marcellus, and nearest the former	7.
Between Telamonides and Marcellus, and nearest the latter	9.
Marcellus	11.

Great uniformity is observable in the size of all these butterflies, their average being that of the ordinary *telamonides*. The examples of *telamonides* especially are strongly marked, the crimson band in a large proportion of them being as conspicuous as is usual in *Walshii*, and the blue lunules near the tail are remarkably large and bright colored. Of the *marcellus*, in addition to the somewhat reduced size, the tails are almost invariably shorter than usual and narrower, and instead of the characteristic single crimson spot, nearly all have two spots, often large. In all these particulars they approach *telamonides*.

To the *telamonides* which emerged after 20th Sept. must be added most of the butterflies which were found dead in the box at that date, and this would bring the number to nearly fifty of that form. There remain of

the original 122 chrysalids (several having died without yielding the imago), 28 chrysalids which are likely to go over the winter. In the experiments recited in But. N. A. as made with chrysalids of *ajax* in the summer of 1871, of several broods of *telamonides* the percentage of butterflies which emerged the same season varied from fifty to sixty, a few dying in chrysalis and the rest over-wintering. In 1870 the proportion of emerging butterflies was larger, but 28 is not an unreasonable number to overwinter out of 122. I conclude, therefore, that the butterflies which have so far emerged this season would naturally have done so, and that the effect of cold has not been to precipitate the emerging of any which would have slept till next spring. And as all which would naturally have emerged this season would have taken the form *marcellus*, the cold has completely changed a large part of these from *marcellus* to *telamonides*, and probably such were from the chrysalids which were subjected to severest cold. The intermediate examples have also changed, but not completely, owing to the lesser degree of cold applied, as before explained; and finally, it seems probable that several chrysalids experienced cold sufficient to retard their emerging and to stunt their growth, but not enough to decidedly change their form. These are the *marcellus*. As to the duration of the chrysalis period, extreme confusion has been produced, so that the emerging, instead of taking place at 14 days after the cold was lessened or withdrawn, as might have been expected, has been protracted through more than two months. In the case of *napi*, as related by Dr. Weismann, where the chrysalids were subjected to cold for three months and then brought into the green-house, the butterflies began to appear in 15 days (or about their natural period), and all that emerged that year did so in the next seven days. In every case the reversion to the winter form was complete; and those chrysalids of the lot which over-wintered all gave the same form in the spring. This it is probable the over-wintering chrysalids of *ajax* will do,—that is, they will give *telamonides* in the spring, and had the degree of cold applied been equal and constant the reversion would probably have been complete. *Telamonides* must be regarded as the primary form of the species. What the position of *Walshii* may be further experiments will perhaps determine.

I append a table showing the dates of emergence of these butterflies:

20th August	1 male		Telamonides.
21st "	1 "	2 females	"
22nd "		1 "	"

24th August..			1 female		Telamonides.
29th "	..1 male				"
31st "	..		1 "		"
1st Sept.....			1 "		"
2nd "	. ..		1 "		"
3rd "	....		1 "	betw'n Telamonides & Walshii.	
3rd "	....1 "				Telamonides.
4th "	....4 "		1 "		"
4th "	....2 "	medium, n'r'st			"
4th "	....2 "	"			Marcellus.
4th "	....2 "				"
5th "	....1 "		1 "		Telamonides.
5th "	....1 "	medium, n'r'st			"
6th "	....1 "				Marcellus.
7th "	....1 "				Telamonides.
8th "	....1 "				Marcellus.
8th "	....		1 "		Telamonides.
9th "	....1 "		1 "	medium, nearest	Marcellus.
13th "	....1 "	medium, n'r'st			"
13th "	....1 "	"			Telamonides.
13th "	....1 "				Marcellus.
14th "	....1 "		1 "	medium, nearest	"
14th "	....1 "	medium, n'r'st			Telamonides.
15th "	. ..1 "				Marcellus.
16th "	....		1 "		"
16th "	....1 "				Telamonides.
18th "	....1 "	medium, n'r'st			Marcellus
19th "	....		1 "		"
20th "	....1 "				Telamonides.
24th "	....1 "				Marcellus.
30th "	.....		1 "		"
2nd October.			1 "		"
3rd "			1 "	medium, nearest	Telamonides.
8th "			1 "	"	"
16th "			1 "	"	"

RESULT :

Telamonides.....	22	spec's.....	11 male,	11	female.
" partly Walshii..	1	"		1	"
Medium, nearest Telamonides	7	"	5 male,	1	"
" " Marcellus	9	"	6 "	3	"
Marcellus.....	11	"	5 "	6	"
	50	"	27 "	22	"

LIST OF SPHINGIDÆ AND ZYGÆNIDÆ OCCURRING ON THE ISLAND OF MONTREAL, P. Q.

BY F. B. CAULFIELD, MONTREAL, P. Q.

MACROGLOSSINI.

1. Sesia thysbe Fabr. Not common ; June.
2. Sesia uniformis Gr. & Rob. Not common ; June.
3. Amphion nessus Hubn. Rare ; June and July.

CHŒROCAMPINÆ.

4. Darapsa myron Walk. Common ; June, July.
5. Deilephila chamaenerii Harris. Abundant ; June.

SMERINTHINI.

6. Smerinthus geminatus Say. Not common ; June.
7. " excaecatus Smith. Not uncommon ; June, July.
8. " myops Smith. Very rare.
9. " modestus Harris. Rare.
10. Cressonia juglandis Smith. Not common ; July.

SPHINGINI.

11. Ceratomia amyntor Hubn. Common ; June.
12. Daremma undulosa Walk. Rare.
13. Sphinx chersis Hubn. Common ; June.
14. " drupiferarum Smith. Common ; June, July.
15. " kalmiae Smith. Common ; June, July. I took a specimen of this moth at sugar, July, 1873.
16. " luscitiosa Clem. Very rare ; taken by Mr. Knetzing.
17. " plota Strecker. Rare ; taken by Mr. Knetzing.
18. Agrius eremitus Hubn. Very rare ; taken by Mr. Knetzing.

AEGERIDAE.

1. Aegeria tipuliformis Linn. Not common ; July.
2. " cucurbitae Harris. I was given a specimen of what I take to be this species July, 1875. I unfortunately lost it, and cannot be positive.

Besides these, two other species have been taken here, but are not yet determined.

THYRIDAE.

1. Thyrus maculata Harris. Rare, on bramble blossoms ; June-

ZYGÆNIDAE.

1. Alypia octomaculata Fabr. Not common ; June, July.
2. " Langtonii Couper. Rare ; June.
3. Eudryas unio Hubn. Rare ; July.
4. " grata Fabr. Not uncommon ; July.
5. Scepsis fulvicollis Walk. Very rare ; taken by Messrs. Couper and Pearson ; June, July.
6. Ctenucha virginica Charp. Very common ; end of June, July.
7. Lycomorpha pholus Harris. Not uncommon ; August.

NOTES.—These are all the species that I have seen from this locality. Mr. Knetzing informs me that he found a larva of *Deilephila lineata* Fabr., but did not succeed in rearing it. Mr. Couper was told by a friend last season (1874) that there had been some large caterpillars on a tomato plot in the outskirts of the city. These were probably larvae of *Macrosila quinquemaculata* Haw. I am of opinion that when proper attention has been given to the larval stages of these groups, many species will be added to this list, and many species that we think are rare will prove to be comparatively abundant.

EXCURSION OF THE MONTREAL BRANCH TO CHATEAUGUAY BASIN, ON DOMINION DAY.

BY C. W. PEARSON, MONTREAL, QUE.

Those of the members who accepted Mr. Jack's kind invitation to visit him on Dominion Day, left town on Thursday, the 30th June. by the 5 p. m. train, for Lachine, where they took the boat and had a delightful sail up the Chateauguay River as far as the Basin, where they were met by Mr. Jack, who conducted them to his beautiful residence, where they were warmly welcomed by the rest of his family. After a delicious supper under the shade of the trees, the party amused themselves in pleasant conversation and in preparing sugar for the evening's

work. As soon as it began to get dusk, a large number of trees were sugared, and in a short time afterwards moths began to fly in considerable numbers. After a fair evening's work, the party, after a pleasant conversation on Entomology and other subjects, retired to their respective chambers. In the morning, after having participated of the hospitality of their kind host in an excellent breakfast, they started out to inspect the orchad and grounds, and found everything in the most perfect order and free from insect pests, owing to the perseverance and attention that was paid to the collecting of the Clisiocampa rings; during the winter as many as 10,000 having been taken and destroyed, and after this enormous destruction a careful search was made for the caterpillars in the spring Mr. Jack deserves great praise for his attention to those pests, and I am sure he is amply repaid for his energy.

After a ramble through the orchard, the party started in skirmishing order across the fields. Nothing much was done until they got near the bush, when business began to be lively; quite a number of good things were captured. The morning was spent in the woods and fields, and in spite of a little shower that made the party seek shelter under some of the old trees, everything passed off well. A number of larvae were found feeding on the nettle, which were brought home and from which I have raised a lot of *V. Milberti*, *P. atalanta* and two of *Grapta satyrus*. After scouring the woods till noon, the party made their way back to Hillside, where they were again treated to a sumptuous repast, after which they reluctantly took leave of their kind hostess and started to inspect the Colorado beetle, which is doing great damage there. After examining a number of potato patches without success, we at last came upon the enemy. Only one specimen of the perfect insect was found, but the larvae were there in considerable numbers, and a hateful sight they are, covering the plants with their filthy excrements and stripping the stalks of their foliage. After killing a lot of them and bottling some for curiosity, we proceeded down the road leading through the Indian Reserve. This is a capital ground for a collector; insects of all descriptions abound on every side, and I am sure that if it was properly worked up, would yield a great many rarities.

When we arrived at Caughnawauga we found the boat waiting, and, bidding good-bye to Mr. Jack and thanking him for his extreme kindness, we went on board, and in a short time were landed at Lachine, and thence to Montreal by train, where we arrived about 7 p. m., having enjoyed ourselves thoroughly.

LIST OF LEPIDOPTERA TAKEN AT CHATEAUGUAY BASIN, JUNE 30TH AND JULY 1ST, 1875.

Papilio turnus Linn.
Pieris rapae Linn.
Colias philodice Godart.
Danais archippus Cram.
Argynnis cybele Fab.
" aphrodite.
" myrina.
Phyciodes tharos Boisd. & Lec.
" nycteis.
Grapta comma.
" progne Cram.
Vanessa Milberti Godart.
Pyrameis atalanta Linn.
Limenitis arthemis Drury.
Euptychia eurytus Fab.
Lethe portlandia.
Pararge Boisduvallii Harris.
Lycaena comyntas Godart.
Eudamus tityrus Fab.
Thorybes pylades Scudd.
Hesperia zabulon Boisd.
" leonardus Harris.
" peckius Kirby.
" mystic Scudd.
" taumas.
Ctenucha virginica Charp.
Euchaetes collaris Fitch.
Thyatira expultrix Grote.
Mamestra nimbosa Guen.
Hadena destructor Grote.
" arctica.
" xylinoides Guen.

And several others not yet determined.

BOOK NOTICES.

THE AMERICAN NATURALIST.—This valuable journal has changed hands, and will in future be published by Messrs. H. O. Houghton & Co., Riverside Press, Cambridge, Mass., under the editorial management of A. S. Packard, Jr., assisted by other eminent men of science. The amount of reading matter in each number is to be increased from fifty-six to sixty-four pages.

In addition to much other interesting material, a series of Centennial Articles on botany, zoology, geology and miscroscopy are promised. We bespeak a greatly increased circulation for this valued periodical, and trust that in future its patronage may be in proportion to its great worth. Every naturalist should take it.

Terms 35 cents a number; $4 a year, postage free. We can also offer the following club rates for the *American Naturalist* and CANADIAN ENTOMOLOGIST: $4 gold, $4.50 American currency.

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